HIRSCHMANN

HiVision 6.0 Manual

Hirschmann Network Management

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1.1 HiVision management shell

HiVision is a management shell for managing Hirschmann agents and for monitoring all SNMP-capable devices linked to the network. The agents can be addressed via SNMP. This provides a comprehensive overview of the whole network. All components are automatically identified. HiVision generates a device view representing the device in its physical form. HiVision also generates a logical view for hubs which displays the device from the perspective of its interfaces (see “Logical Map” on page 111). The device information window in HiVision provides information on the most important system parameters such as the system description, the MAC address, ...

This enables at all times

- the current status of your network to be displayed,
- a rapid, comprehensive analysis, error search and control even with complex networks.

Intuitive operation makes the use of functions both straightforward and rapid. The network components are displayed as gray scale images. Color overlayed status displays, click-on context menus at port, group and device level provide further detailed information.
Multiple help functions and integrated expert knowledge facilitate effective management without requiring special expertise on the part of the user

The following HiVision versions are available:

- PC-StandAlone version under Windows NT
- PC-StandAlone version under Linux
- Integration in the PC management platform HP OpenView for Windows NT
- Integration in a HPUX management platform HP OpenView.

PC-StandAlone version under Windows

Designed as an economical starter solution for small to medium size networks with a modular design, the PC StandAlone solution for Windows NT opens up a wide range of management options.
Auto-discovery of all components at program start-up, live monitoring of the network, and extensive configuration and monitoring functions offer a broad range of options for network administration.
Trap handling with RMON alarms, event handling and freely definable actions guarantee a differentiated, proactive monitoring of complex networks.

PC-StandAlone Version under Linux

The complete network management functionality of the PC stand-alone version for Windows NT is also available under Linux. The high-capacity Linux operating system and powerful hardware meet the highest standards in respect of stability and performance.
Trap handling with RMON alarms and event handling guarantee a differentiated, proactive monitoring of complex networks.

Integration in the PC management platform HP OpenView for Windows NT

In addition to the PC StandAlone solution, all the options of the management platform HP OpenView are open to the administrator under Windows NT.
HiVision forwards status changes to the platform and thus affects the way in which the symbols are displayed in the platform.

Integration in the HPUX management platform HP OpenView

In addition to the PC management platform under Windows, the powerful Unix operating system with high capacity hardware fulfils the most demanding criteria in relation to stability and performance. Long-term investment security and migration paths in respect of business and management systems are guaranteed by the support of major producers.

1.2 The HiVision basic structure

1.2.1 The HiVision program

HiVision is made up of a core program together with one to two modules. The modules allow individual adaptation to the network. The modules are called:

- Industrial Line
  for all ETHERNET (shared) components via the management card MIKE inside the ASGE/MC/AMC and
  Rail family for the Rail Switch RS2, MICE family as well as MR8.
- Enterprise
  for ALS, GLS, MACH3000, GRS, Switches, FAMAMM2 and Multi-MIKE inside the AMC and
  for all FDDI components via the management card FCMA inside the ASGE/MC
  as well as the Hubs ETH-12TP/M, ETPS-22TP/M and FEH-24TP/M ds

The scope of delivery includes the core program with all modules. The modules cannot be run without valid license keys. The core program already contains the Rack Monitoring System administration and the basic administration of unknown devices.

1.2.2 The HiVision management platform

The management shell is arranged in three levels with corresponding windows:

- Main window
  The main window provides an overview over all contactable agents in the network. Settings made in the main window affect the whole system.

- Device window
  The device window contains various views of a selected device. Colored symbols mean that the condition of the whole device, right down to the individual ports, can be seen at a glance.
- Detail window
  The status messages can be qualified in the detail windows. The display shows the MIB attributes read out from this device.
  The detail information is subdivided into the groups
  - configuration,
  - performance,
  - error and
  - security.

  When the mouse pointer is positioned over an MIB attribute, the description of the MIB attribute is shown by a bubble help.
  Writeable MIB attributes can be reset in this window. The prerequisite is the appropriate access entitlements.

The main component of each window is a card-index. The individual cards display the contents of the card-index (= the device in the device window) from various perspectives.

1.3 With HiVision manageable products

The following list shows the name of the products from the Hirschmann product range, which are manageable with HiVision 6.0.

ETHERNET	FDDI	TokenRing
CYDE	FCMM-MIC	TCTMM-BFOC
KYDE-S	FCMM-BFOC	TCLTP6-RJ45
KYDE-S (RBDE)	FCLC3-DSC	TCTTP-RJ45
OYDE-S	FCBMS-BFOC	
OYDE-S (RBDE)	FCSM-BFOC	
TYDE	FCAM-BFOC	
IYDE-S	FCTP3-RJ45	
IYDE-S (RBDE)	FCSTP	
UYDE	FCMA	
ECAUI		
ECFL2		
ECFL4		
ECFB2		
ECTP3		
MIKE		

Table 1: Manageable interface cards for concentrators, hubs, MC, ASGE family

ETHERNET	FDDI	TokenRing
EAFL4	FATP6-GS-RJ45	TALTP12-GS-RJ45
EAFL4-GS	FATP6-GS-DB9	TATLMM-GS
EAFL4-PS	FALC6-GS-DSC	TATLTP-GS-RJ$%
EAFL8	FAMM2-GS-DSC	
EAFL8-GS	FAMAMM2-GS	
EAFB4		
EAFB4-GS		
EATP12		
EATP12-GS		

Table 2: Manageable interface cards for Advanced Media Centers

ETHERNET	FDDI	TokenRing
EATP12-PS		
EATP12-FS		
EACX8		
EACX8-GS		
EAAUI		
EAAUI4-GS		
EAMAFL2		
EAMAFL2-GS		
EAMAFB2-GS		
FastSXM2		
100EATP10-GS		
FERxM		
AESMM		
ESTP6		
MultiMIKE		

Table 2: Manageable interface cards for Advanced Media Centers

MR8-03	ALS	GLS	MACH 3000	MICE 2000
EBAUI	ELTP6	ELTP2-M	M-BASIC4	MS2108-2
EBGM	ELCX6	ELTP12-F	M-ETH 4MM-ST	MM2-4TX1
EBMM	ELMM6	ELMM10-F	M-FAST 8Tp-RJ	MM2-4FXM3
EBSM	ELCX8	100ELTP4-F	M-FAST 2MM-SC	MM2-2FXM3/2TX1
EBSMP	ELTP12	100ELMM4-F	M-FAST 2SM-SC	MM2-2FXM2
EBTP	ELTP2-M	100ELSM4-F	M-FAST 8MM-MT	MM2-2FXS2
	100ELMM2	100ELTP12	M-GIGA 2SX-SC	
	100ELTP2	100ELMM12	M-GIGA 1LX-SC	
	100ELTP4	1000ELMM1		
	100ELMM4	1000ELMM1+1R		
	1000ELMM1-SC	1000ELSM1+1R		
	1000ELMM1+1R			
	1000ELMS1+1R			
	AAMM2			
	AATP2			

Table 3: Manageable interface cards and modules for switches

GRS	ASGE, MC, AMC
1000EGLX2+2-SC	ERISDN
1000EGLX2-SC	ACCESS-RXM2
1000EGSX2+2-SC	
1000EGSX2-SC	
1000EGSX6-SERV	
100EGFX10-SC	
100EGTP20-RJ45	
100 EGFX20-MTRJ	
FGMM2-SC	

Table 4: Manageable interface cards for routers

Chassis	H Switches	H Hubs	Rail Switches
ASGE 1	ETS-12TP/M	ETH-12TP/M	RS2-FX/FX
ASGE 2	ETS-24TP/M	ETPS-22TP/M	RS2-FX-SM/FX-SM
ASGE-WG 24/TP	ETS-12MM/M	FEH-24TP/M ds	RS2-TX/TX
ASGE-WG 24TP/M	ETS-12MM-VF45/M		
AMC 503	ETS-14TP		
AMC 1006	ETS-30TP		
MR8-03	ETS-16TP Plus		
ALS 1605	ETS-32TP Plus		
ALS 1604	FES-08TP Plus		
ALS 402	FES-16TP Plus		
ALS 201	FES-16TP		
ALS 101	FES-24TP Plus		
GLS 402	GES-24TP/2SX		
GLS 1605	GES-16FX		
GRS 1403	GES-24TP Plus		
GRS 702			
MACH 3002			
MACH 3005			
MS2108-2			
RMS			

Table 5: Manageable devices

1.4 Supported MIBs

HiVision 6.0 supports the Hirschmann Private MIBs as well as the following standard MIBs:

- rfc1213-MIB-II.mib
- rfc1398-ETHER.mib
- rfc1493-BRIDGE.mib
- rfc1512-FDDI.mib
- rfc1516-REPEATER.mib
- rfc1724-RIP.mib
- rfc1757-RMON.mib
- rfc1850-OSPF.mib
- rfc2613-SMON.mib
- rfc2239-MAU.mib
- IANAifType-MIB.mib

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In the first part of this chapter, the file structure on the HiVision CD is detailed. This is followed by the section on installation, subdivided according to the various shells. The chapter on installation is concluded by the procedure for setting an agent's trap targets.

2.1 File structure of the HiVision CD

The following file structure can be presented in different ways depending on the platform. Thus the file names for HP-UX appear in upper case letters while those for AIX and Solaris are in lower case.

`HPUX`	HiVision 6.0 for HPUX and OpenView
`HIVISION.DEPOT`	Depot HiVision 6.0 for HP-UX and OpenView
`LINUX`	HiVision 6.0 for Linux
`HIVISION.TAR`	StandAlone HiVision 6.0 as a tar-file
`WINDOWS`	HiVision 6.0 for Windows NT and Windows 2000
`SETUP.EXE`	Installation program
`ACROREAD`	Installation programs for Acrobat Reader
`JAVA`	Java for UNIX
`README.HTM`	“readme” file in HTML format
`README.TXT`	“readme” file in ASCII format
`HANDBUCH.PDF`	German manual HiVision in Acrobat Reader format
`MANUAL.PDF`	HiVision manual in Acrobat Reader format
`AGREE.PDF`	License agreement in Acrobat Reader format
`LICENSE.PDF`	Leaflet on ordering license in Acrobat Reader format

2.2 PC-StandAlone solution for Windows NT/2000

2.2.1 Installation requirements

HiVision 6.0 requires for installation and operation:

- Hardware

  Processor: Pentium 200 or better (Pentium III recommended)

  Memory: 64 MB or better, 128 MB (recommended)
  HiVision requires approximately 50 MB free RAM, plus another 200 kB RAM for each detected agent.
  In addition to this the network management station requires RAM for the operating system and any other applications it may use.

  Hard disk: 30 MB free
- Windows NT 4.0 or Windows 2000
- License for HiVision 6.0 (see “The HiVision program” on page 21, “Licenses” on page 81 and “Order form for license on page 263”.

Windows NT or Windows 2000 is normally installed prior to delivery on the PC. The version concerned should be checked in all cases.

Prerequisites with respect to the **Hirschmann agents**
MIKE software release 3.4
MultiMIKE software release 1.5
FCMA software release 3.4
MultiLAN Switch software release 2.1
Advanced LAN Switch release 2.12
Gigabit LAN Switch Release 3.20
Gigabit Routing Switch 3.2
HiWay Workgroup Switches FES-24TP Plus und GES-24TP/2SX 2.0.0.2, GES-24TP Plus 2.1.4
Rack Monitoring System 1.4b3 H2-14
MACH 3000 Rel. 2.12
Rail Switch RS2-../.. Rel. 3.0
MICE Rel. 1.0

2.2.2 Installation

Administration entitlements are required before you can install HiVision.

☐ Insert the HiVision CD in the drive.
The setup program starts automatically.

☐ Select the language and follow the instructions in the installation program.

☐ Select `HiVision StandAlone` and, if required, the Demo-Switch and HiControl (refer “OPC server” on page 61).

Note: If user-specific data from an earlier installation already exists then this is retained, even when the new installation is made is the same directory.

2.2.3 Program start

The following settings are nescessary to run HiVision:

☐ The Acrobat Reader `acroRD32.exe` is needed to view the online manual. Complement the environment variable PATH correspondingly. For this purpose enter under
`My Computer:Properties:Environment` (Windows NT)
`My computer:Properties:Advanced:Environment Variables` (Windows 2000)
the path to the Acrobat directory.

☐ After standard installation, all system users of HiVision access the same system configuration and network configuration file.
Status configurations and the network configuration file can be saved user-specifically. For this purpose, the system administrater relocates the system variable HOME created by HiVision to the user variables with:
`My Computer:Properties:Environment` (Windows NT)
`My computer:Properties:Advanced:Environment Variables` (Windows 2000)

☐ Select the language by setting the environment variable `COUNTRY`. Currently `USA`, `GB` and `D` are supported. `USA` is the default.
With the right mouse button, select:
`My Computer:Properties:Environment` (Windows NT)
`My computer:Properties:Advanced:Environment Variables` (Windows 2000) .
In the "User Variables" box, enter the variable `COUNTRY` and the desired language as value.
Click "Set" and then "Apply".

☐ Enter the license key (see “License window” on page 69).

☐ Start HiVision with the symbol on the desktop or from the start menu:
`Start:Programs:Hirschmann:HiVision:HiVision 6.0`
Or start HiVision with a command-line parameter:
Select the "HiVision 6.0" icon with the right mouse button under `Start:Programs:Hirschmann:HiVision`. In the "Properties" window, enter the desired option(s) after the program name.

Parameter	Meaning
-EditLicense (-L)	Edit licences
-GuiStyle (-gui) [Motif|Windows]	Set Look & Feel (default: System dependant)
-IgnoreUnknownAgents (-iua)	Only scan known agents
-NoMacAddressTables (-nmac)	Don't load MAC address tables
-NoNameserver (-dns)	Don't use Domain Name Server
-NoOVwActivityIndicator (-novwflash)	Disable animated OpenView callback activity indicator
-NoSNMPActivityIndicator (-nsnmpflash)	Disable animated SNMP activity indicator
-NoTraps (-nt)	Disable trap reception
-OpenAgentImage (-oi) <IP-Address>	No network scan, only scan <IP-Address> and open image
-quiet (-q)	Don't show startup banner
-ReadOnly	HiVision is readonly
-remote	Send commandline to a running HiVision
-ScanAgent (-a) <IP-Address>	No network scan, only scan <IP-Address>
-ShowErrorLog (-serr)	Show errors in log window; display other errors in addition to SNMP time-outs
-SortTime (-st) <min>	Sort agentlist every <min> minutes (0: no sort, default: 5)
-SyntaxChecker	Checks PSMs for syntax errors and consistency

Table 6: Command-line parameters for starting HiVision

☐ Enter the network area to be scanned by HiVision under the `configuration:Network Configuration...`.
With `Edit:Scan for new Devices`, HiVision searches for devices in the entered address areas.
If no network area has been entered when HiVision is started, HiVision automatically opens the 'Network configuration...' window. Enter the network area to be scanned by HiVision.

☐ Enter the communities for Snmp access to the agents in the SNMP configuration window (`Configuration: SNMP Configuration...`):
`public` is the default read community and `private` is the default set community. Enter the IP address in the 'IP Address' field in the form `x.x.x.x`. Each 'x' stands for a number from 0 to 255. The asterisk, used here as the so-called 'wildcard', stands for any number from 0 to 255.

2.2.4 Updates

☐ Deinstall HiVision according to “Deinstallation” on page 38.

☐ Install HiVision according to “Installation” on page 36.

2.2.5 Deinstallation

Note: The deinstallation maintains the directory `%HIVISION_ROOT%/data/var`. It contains your user specific files (see “Installation” on page 36). Archive these files at a secure place if you wish to reinstall this version of HiVision later.

☐ For deinstallation, select in the start menu:
`Start:Programs:Hirschmann:Deinstallation of HiVision Toolbox`

Note: The license file `HiVision key` and other configuration files are removed by deleting the Hirschmann directory.

2.3 PC-StandAlone solution for Linux

2.3.1 Installation prerequisites

HiVision 6.0 requires for installation and operation:

- Hardware
  Processor: Pentium 200 or better (Pentium III recommended)
  Memory: 64 MB or better, 128 MB (recommended)
  HiVision requires approximately 50 MB free RAM, plus another 200 kB RAM for each detected agent.
  In addition to this the network management station requires RAM for the operating system and any other applications it may use.
  Hard disk: 30 MB free
- Linux
  Kernel from 2.2, libc6.1
- License for HiVision 6.0 (see “The HiVision program” on page 21, “Licenses” on page 81 and “Order form for license on page 263”.

Installation of Linux is the responsibility of the user or system administrator.

Prerequisites with respect to the **Hirschmann agents**
MIKE software release 3.4
MultiMIKE software release 1.5
FCMA software release 3.4
MultiLAN Switch software release 2.1
Advanced LAN Switch release 2.12
Gigabit LAN Switch Release 3.20
Gigabit Routing Switch 3.2
HiWay Workgroup Switches FES-24TP Plus und GES-24TP/2SX 2.0.0.2, GES-24TP Plus 2.1.4
Rack Monitoring System 1.4b3 H2-14
MACH 3000 Rel. 2.12
Rail Switch RS2-../.. Rel. 3.0
MICE Rel. 1.0

Note: If an old version of HiVision is installed, then deinstall it before installing a new version.

2.3.2 Installation

Read/write access to the root directory is required for installation of HiVision.

☐ Mount CD on `/cdrom`.

☐ Unpack the tar-file into the root directory
```
cd /↵
tar -xvpf /cdrom/solaris/hivision.tar↵
```

☐ Adopt the HiVision path `/opt/HiVision/bin` in the environment variable `PATH`.

2.3.3 Program start

The following settings are nescessary to run HiVision:

☐ Adopt the environment variable `HIVISION_ROOT` the path `/opt/HiVision`.

Procedure for ksh in the file `.kshrc`:
```
export HIVISION_ROOT=/opt/HiVision
```

Procedure for `bash` in the.`bash_profile` file :
```
export HIVISION_ROOT=/opt/HiVision
```

☐ Saving of status configurations and network configuration occurs for each system user. These Datas are saved in the directory $HOME/.hivision.

☐ To receive traps, start the HiVision Trap Daemon as superuser:

```
/opt/HiVision/bin/hi_trapd.sh -s↵
```

☐ The Acrobat Reader acroread is needed to view the Online manual. Set the environment variable PATH correspondingly.

☐ Select the language by setting the environment variable COUNTRY. Currently USA, GB and D are supported. USA is the default.

☐ Enter the license key (see “License window” on page 69).

☐ Start HiVision by typing
HiVision↵
Or start HiVision with a command-line parameter:
HiVision↵ followed by one or more parameters.

Parameter	Meaning
-EditLicense (-L)	Edit licences
-GuiStyle (-gui) [Motif|Windows]	Set Look & Feel (default: System dependant)
-IgnoreUnknownAgents (-iua)	Only scan known agents
-NoMacAddressTables (-nmac)	Don't load MAC address tables
-NoNameserver (-dns)	Don't use Domain Name Server
-NoOVwActivityIndicator (-novwflash)	Disable animated OpenView callback activity indicator
-NoSNMPActivityIndicator (-nsnmpflash)	Disable animated SNMP activity indicator
-NoTraps (-nt)	Disable trap reception
-OpenAgentImage (-oi) <IP-Address>	No network scan, only scan <IP-Address> and open image
-quiet (-q)	Don't show startup banner
-ReadOnly	HiVision is readonly
-remote	Send commandline to a running HiVision
-ScanAgent (-a) <IP-Address>	No network scan, only scan <IP-Address>
-ShowErrorLog (-serr)	Show errors in log window; show other errors in addition to SNMP time-outs

Table 7: Command-line parameters for starting HiVision

Parameter	Meaning
-SortTime (-st) <min>	Sort agentlist every <min> minutes (0: no sort, default: 5)
-SyntaxChecker	Check PSM for syntax errors and consistency

Table 7: Command-line parameters for starting HiVision

☐ Enter the network area to be scanned by HiVision under the `configuration`:Network Configuration….
With `Edit:Scan for new Devices`, HiVision searches for devices in the entered address areas.
If no network area has been entered when HiVision is started, HiVision automatically opens the 'Network configuration...' window. Enter the network area to be scanned by HiVision.

☐ Enter the communities for Snmp access to the agents in the SNMP configuration window (`Configuration: SNMP Configuration...`): `public` is the default read community and `service` is the default write community. Enter the IP address in the 'IP Address' field in the form `x.x.x.x`. Each 'x' stands for a number from 0 to 255. The asterisk, used here as the so-called 'wildcard', stands for any number from 0 to 255.

2.3.4 Updates

☐ Deinstall HiVision according to “Deinstallation” on page 45.

☐ Install HiVision according to “Installation” on page 42.

2.3.5 Deinstallation

Read/write access to the `root` directory is required for deinstallation of HiVision.

☐ Inside the directory /`opt` remove the directory `HiVision`

```
cd /opt↵
rm -rf HiVision↵
```

Note: In this process the license file is removed also.

2.4 Integration with HP Open-View for Windows NT/2000

2.4.1 Installation prerequisites

HiVision 6.0 requires for installation and operation:

- Hardware

Processor:	Pentium II or better (Pentium III recommended)
Memory:	128 MB or better, 256 MB (recommended) HiVision requires approximately 50 MB free RAM, plus another 200 kB RAM for each detected agent. In addition to this the network management station requires RAM for the operating system and any other applications it may use.
Hard disk:	30 MB free

- HP-OpenView V 5.0x, 6.0, 6.1, 6.2
- License for HiVision 6.0 (see “The HiVision program” on page 21, “Licenses” on page 81 and “Order form for license on page 263”.

The user or system administrator is responsible for installation of HP OpenView.

Prerequisites with respect to the **Hirschmann agents**
MIKE software release 3.4
MultiMIKE software release 1.5
FCMA software release 3.4
MultiLAN Switch software release 2.1
Advanced LAN Switch release 2.12
Gigabit LAN Switch Release 3.20
Gigabit Routing Switch 3.2
HiWay Workgroup Switches FES-24TP Plus und GES-24TP/2SX 2.0.0.2, GES-24TP Plus 2.1.4
Rack Monitoring System 1.4b3 H2-14
MACH 3000 Rel. 2.12
Rail Switch RS2-../.. Rel. 3.0
MICE Rel. 1.0

2.4.2 Installation

☐ Insert the HiVision CD in drive.
The setup program starts up automatically.

☐ Select the language and follow the instructions in the installation program.

☐ Select `HiVision for HP OpenView` and, if required, the Demo-Switch and HiControl (refer “OPC server” on page 61).

Note: If user-specific data from a previous installation is already in existence, then this is retained, even if the new installation was undertaken in the same directory.

2.4.3 Program start

☐ The Acrobat Reader `acroRD32.exe` is needed to view the online manual. Extend the environment variable `PATH` correspondingly. For this purpose enter under
`My Computer:Properties:Environment` (Windows NT)
`My computer:Properties:Advanced:Environment Variables` (Windows 2000)
the path to the Acrobat directory.

☐ After standard installation, all system users of HiVision access the same system configuration and network configuration file.
Status configurations and the network configuration file can be saved user-specifically. For this purpose, the system administrater relocates the system variable HOME created by HiVision to the user variables with:
`My Computer:Properties:Environment` (Windows NT)
`My computer:Properties:Advanced:Environment Variables` (Windows 2000)

☐ Select the language by setting the environment variable `COUNTRY`. Currently `USA`, `GB` and `D` are supported. `USA` is the default.
With the right mouse button, select:
`My Computer:Properties:Environment` (Windows NT)
`My computer:Properties:Advanced:Environment Variables` (Windows 2000) .
In the "User Variables" box, enter the variable `COUNTRY` and the desired language as value.
Click "Set" and then "Apply".

☐ Enter the license key (see “License window” on page 69).

☐ Start HiVision in HP OpenView via the menu item `HiVision:Start`.
Or start HiVision with a command-line parameter:
To set an option, edit the `/registration/C/hivision_registration` file in the OpenView installation directory.
The command call is then: `Command -Shared $HIVISION_ROOT/bin/OVwHiVision -<Parameter>"`.

Parameter	Meaning
-EditLicense (-L)	Edit licences
-GuiStyle (-gui) [Motif|Windows]	Set Look & Feel (default: System dependant)
-IgnoreUnknownAgents (-iua)	Only scan known agents
-JavaGrapher (-jg)	Use the Java Grapher instead of the OV Grapher
-NoMacAddressTables (-nmac)	Don't load MAC address tables
-NoNameserver (-dns)	Don't use Domain Name Server
-NoOVwActivityIndicator (-novwflash)	Disable animated OpenView callback activity indicator
-NoSNMPActivityIndicator (-nsnmpflash)	Disable animated SNMP activity indicator
-NoTraps (-nt)	Disable trap reception
-OpenAgentImage (-oi) <IP-Address>	No network scan, only scan <IP-Address> and open image
-quiet (-q)	Don't show startup banner
-ReadOnly	HiVision is readonly
-ReadOnlyOVw	HiVision is read-only if OV map is read-only
-remote	Send commandline to a running HiVision
-ScanAgent (-a) <IP-Address>	No network scan, only scan <IP-Address>
-ShowErrorLog (-serr)	Show errors in log window; display other errors in addition to SNMP time-outs

Table 8: Command-line parameters for starting HiVision

Parameter	Meaning
-SortTime (-st) <min>	Sort agentlist every <min> minutes (0: no sort, default: 5)
-SyntaxChecker	Checks PSMs for syntax errors and consistency

Table 8: Command-line parameters for starting HiVision

`Open Device` can only open an agent when HiVision has already been started. Otherwise when HiVision is started, the agent is not opened.

2.4.4 Updates

☐ Deinstall HiVision according to “Deinstallation” on page 50.

☐ Install HiVision according to “Installation” on page 48.

2.4.5 Deinstallation

Note: The deinstallation maintains the directory `%HIVISION_ROOT%/data/var`. It contains your user specific licence file. Archive this file at a secure place if you wish to install this version of HiVision at a later time again.

☐ For deinstallation, select in the start menu:
`Start:Programs:Hirschmann:Deinstallation of HiVision Toolbox`

☐ Double click symbol “Software”

☐ Select HiVision and click `Add/Remove`...

Note: The license file HiVision key and other configuration files are removed by deleting the HiVision directory.

2.5 Integration in HP OpenView for HP-UX

2.5.1 Installation prerequisites

HiVision 6.0 requires for installation and operation:

Hardware
HP Series 700

Memory	:128 MB or better, 256 MB (recommended) HiVision requires approximately 50 MB free RAM, plus another 200 kB RAM for each detected agent. In addition to this the network management station requires RAM for the operating system and any other applications it may use.
Hard disk	:50 MB free

- HP-UX Version 10.20 with
  HP OpenView Network Node Manager Version 5.0x

  or

  HP-UX Version 11.00 with
  HP OpenView Network Node Manager Version 6.0, 6.1, 6.2
- License for HiVision 6.0 (see “The HiVision program” on page 21, “Licenses” on page 81 and “Order form for license on page 263”.

HP-UX is normally installed prior to delivery on the workstation. The version concerned should be checked in all cases.

The user or system administrator is responsible for installation of HP OpenView.
Before installing the HiVision, ensure that HP OpenView has been installed with the Node Manager platform.

Prerequisites with respect to the **Hirschmann agents**
MIKE software release 3.4
MultiMIKE software release 1.5
FCMA software release 3.4
MultiLAN Switch software release 2.1
Advanced LAN Switch release 2.12
Gigabit LAN Switch Release 3.20
Gigabit Routing Switch 3.2
HiWay Workgroup Switches FES-24TP Plus und GES-24TP/2SX 2.0.0.2, GES-24TP Plus 2.1.4
Rack Monitoring System 1.4b3 H2-14
MACH 3000 Rel. 2.12
Rail Switch RS2-../.. Rel. 3.0
MICE Rel. 1.0

Note: If an old version of HiVision is installed, then deinstall it before installing a new version.

2.5.2 Installation

If HP OpenView is active, it must be closed via `File:Exit` before starting installation.

Read/write access to the `root` directory is required for installation of HiVision.

The installation routine supposes that the environment variable `$OV_BIN` is set. Be sure, that the Network Node Manager is started with `$OV_BIN/ovstatus`.

☐ Mount the HiVision CD (in this case /cdrom)
```
mount /cdrom↵
```

☐ Install HiVision with the program “swinstall”. “swinstall” is part of “HP Software Distributor”.
Start the program by typing
`swinstall↵`

Note: If the NNM is installed as part of a bundle, (e.g. ITO bundle, ITO-EngOrzAll), an error message will be issued. It can be bypassed by switching off the option “Enforce Script Failures” in the menu Options.

☐ Enter the Source Depot Path:
`/cdrom/HPUX/INSTALL/HIVISION.DEPOT.`

☐ Select bundle `HiVision`.

☐ Execute action `Install (analysis)`….

☐ On successful completion of the analysis phase, click “OK” for installation.

☐ Observe fault messages or warnings in the log window.

Without starting HP OpenView you may verify the installation with the aid of the HP tool `swverify`.

☐ Start the program by typing
`swverify HiVision↵`

2.5.3 Program start

Individual input of the license key and setting the general environment variables is necessary.

☐ The Acrobat Reader acroread is needed to view the Online manual. Set the environment variable `PATH` correspondingly.

☐ Select the language by setting the environment variable `COUNTRY`. Currently `USA`, `GB` and `D` are supported. `USA` is the default.

☐ Enter the license key (see “License window” on page 69).

☐ Start HiVision in HP OpenView via the menu item `HiVision:Start`.
Or start HiVision with a command-line parameter:
To set an option, edit the `/registration/C/hivision_registration` file in the OpenView installation directory.
The command call is then: `Command -Shared $HIVISION_ROOT/bin/OVwHiVision.sh -<Parameter>"`.

Parameter	Meaning
-EditLicense (-L)	Edit licences
-GuiStyle (-gui) [Motif|Windows]	Set Look & Feel (default: System dependant)
-IgnoreUnknownAgents (-iua)	Only scan known agents
-JavaGrapher (-jg)	Use the Java Grapher instead of the OV Grapher
-NoMacAddressTables (-nmac)	Don't load MAC address tables
-NoNameserver (-dns)	Don't use Domain Name Server
-NoOVwActivityIndicator (-novwflash)	Disable animated OpenView callback activity indicator
-NoSNMPActivityIndicator (-nsnmpflash)	Disable animated SNMP activity indicator
-NoTraps (-nt)	Disable trap reception
-OpenAgentImage (-oi) <IP-Address>	No network scan, only scan <IP-Address> and open image
-quiet (-q)	Don't show startup banner
-ReadOnly	HiVision is readonly
-ReadOnlyOVw	HiVision is read-only if OV map is read-only
-remote	Send commandline to a running HiVision
-ScanAgent (-a) <IP-Address>	No network scan, only scan <IP-Address>
-ShowErrorLog (-serr)	Show errors in log window; display other errors in addition to SNMP time-outs
-SortTime (-st) <min>	Sort agentlist every <min> minutes (0: no sort, default: 5)
-SyntaxChecker	Checks the PSMs for syntax errors and consistency

Table 9: Command-line parameters for starting HiVision

`Open Device` can only open an agent when HiVision has already been started. Otherwise when HiVision is started, the agent is not opened.

2.5.4 Updates

☐ Deinstall HiVision according to “Deinstallation” on page 57.

Note: With Release 4.0 HiVision uses new device symbols. Delete symbols of earlier releases in the shell.

☐ Install HiVision according to “Installation” on page 54.

2.5.5 Deinstallation

If HP OpenView is active, it must be closed via `File:Exit` before starting deinstallation.

Read/write access to the `root` directory is required for deinstallation of HiVision.

Note: The deinstallation maintains the directory `/opt/HIVISION_ROOT/data/var`. It contains your user specific files. Archive these files at a secure place if you wish to install this version of HiVision at a later time again.

☐ Deinstall HiVision with the program “swremove”. “swremove” is part of “HP Software Distributor”.
Start the program by typing
`swremove`↵

☐ Select bundle `HiVision`.

☐ Execute the action `Remove (analysis)`....

☐ On successful completion of the analysis phase, click “OK” for deinstallation.

☐ Observe fault messages or warnings in the log window.

Note: After deinstallation, the vendor field of the OpenView database is still set to Hirschmann.

Note: For deinstallation you always need the deinstallation program which matches the installation program with the same version number.

2.6 Trap destinations of the agent

☐ Enter the IP-address of your management station as trap destination address into the Hirschmann agent.

Examples: ETHERNET Agent (MIKE, MultiMIKE)

–Enter `trap destination address` into the file `mibadm2.ini` (refer to the manual of the Hirschmann agents).

–Entry via configuration file card:
Select `configuration` in the device window on the agent symbol with the right-hand mouse key. Enter the `trap destination address` in the card "Trap Destination" (with appropriate access entitlement).

Examples: Multi Device Agent

After selecting the desired agents in the main window, click the Multi Agent button on the tool bar.

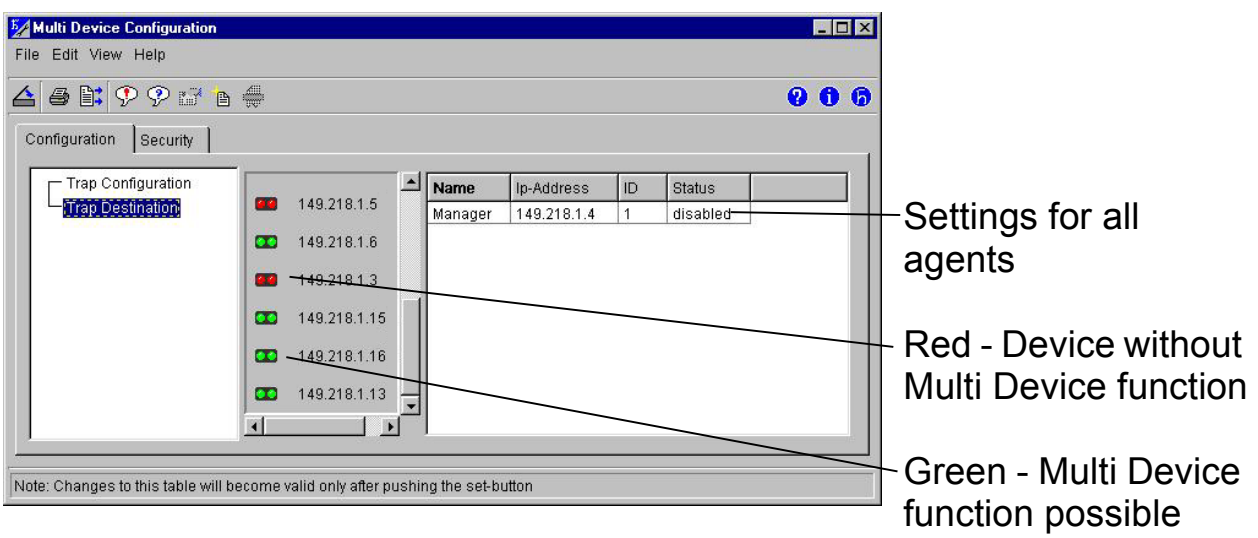

Fig. 1: Multi Device configuration

Clicking the "Set" button transmits the configuration to the agents. New settings overwrite existing settings in the agent that have the same ID.

After the next scan, HiVision displays only those configuration settings which all selected agents have in common.

2.7 OPC server

OLE For Process Control (OPC) is a standardized interface for process data management in the automation industry used for exchanging data objects between applications. OPC is based on Microsoft's Object Linking and Embedding (OLE) method, which is widely known today as the Distributed Component Object Model (DCOM).

The Hirschmann HiControl OPC Server is both an OPC Data Access server and an OPC Alarm und Event server. In combination with the Windows NT or Windows 2000 SNMP Trap Service it provides the SNMP Trap functions from certain Hirschmann network components to the OPC Alarm und Event interface. In connection with the HiVision network management software, HiControl provides a status display and a status updating facility for all network components which can be managed by HiVision.

HiControl starts automatically after a request from an OPC client if HiControl was selected in the installation proceeding.

Answers to the frequently asked questions, for example integration into process visualization systems, can be found on Hirschmann's Internet site (see "Frequently asked questions" on page 241).

OPC Data Access Specification

HiControl 1.0 implements the OPC Data Access Specification Version 2.03.
HiControl 1.0 provides device status interrogation for all devices managed by HiVision.

Definitions for Data Access can be found in "Data access definitions for OPC servers" on page 243.

OPC Alarm and Event Specification

HiControl 1.0 implements the OPC Alarm and Event Specification Version 1.01.
HiControl 1.0 generates the following events:

Events which affect the OPC Server itself:
– Connection events with Windows SNMP Trap Service
– Connection events with HiVision network management software

Events which affect all SNMP-compatible network components:
– Cold start/warm start of the device
– Authentication error during SNMP access
– Link down / up at a port
– Change of device status of an SNMP agent managed by HiVision

Events which affect the Hirschmann Industrial Rail Switch RS2, Modular Industrial Communication Equipment MICE or MACH 3000 Backbone Switch:
– Self-test error
– Standby mode changed
– Login via Telnet
– Duplicated address table entry
– Temperature outside specified range
– Power supply failure
– Ventilator failure
– Signal relay activated
– Card assembly changed
– Modulbe assembly changed
– Configuration Dual Homing changed
– Redundancy state Dual Homing changed
– Configuration HIPER-Ring changed
– New users from user groups
– Security relevant event from user groups

Definitions of events can be found in “Event definitions for OPC servers” on page 245.

3 Overview of HiVision

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This brief overview gives you the basics on the structure of the HiVision network-management software - as well as the principles behind the application philosophy.

3.1 Function overview

3.1.1 Main window

Once you start HiVision, the main window appears on the screen. It has four main parts:

- menu bar,
- tool bar,
- card-index, which provides information on the entire network based on the selected card,
- status bar.

For more information, see “"HiVision" main window” on page 75.

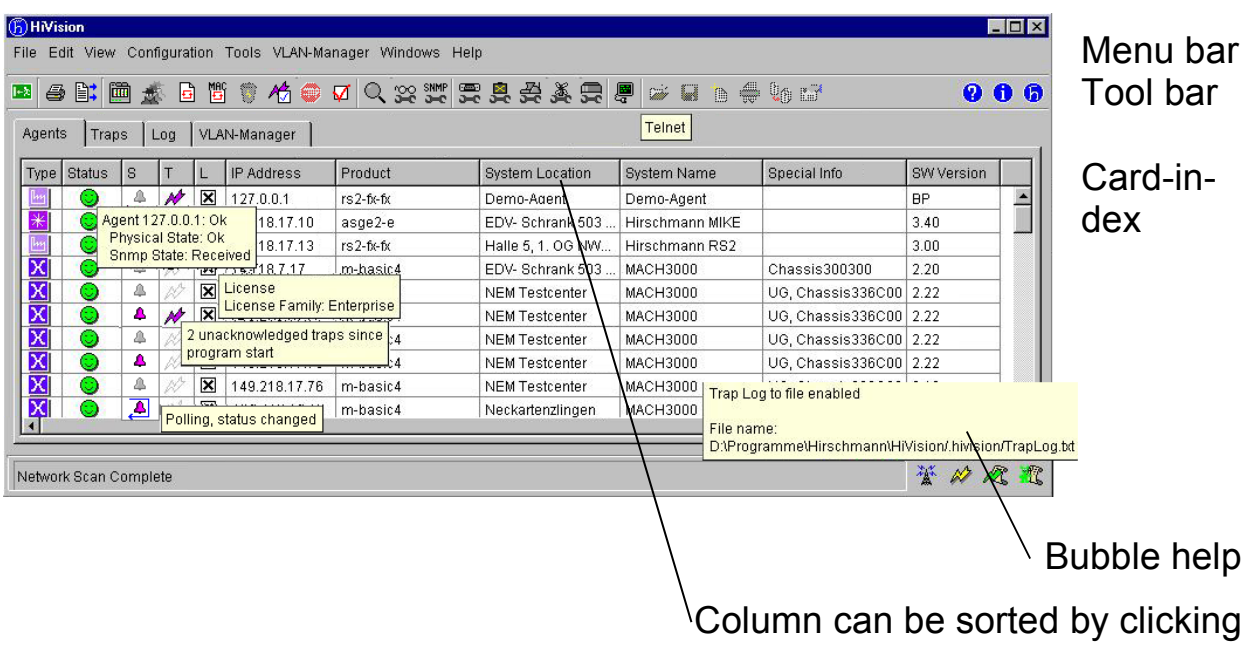


Fig. 2: Main window

Using

– Column contents can be sorted by clicking the column heading
– Column width can be adjusted by dragging the column border
– Multiple selection with Ctrl and Shift like in Windows
– Bubble help can be called up depending on pointer location

3.1.2 Device window

Double-clicking a device row in the main window (see Fig. 2) opens the associated device window (see “Device window” on page 99).

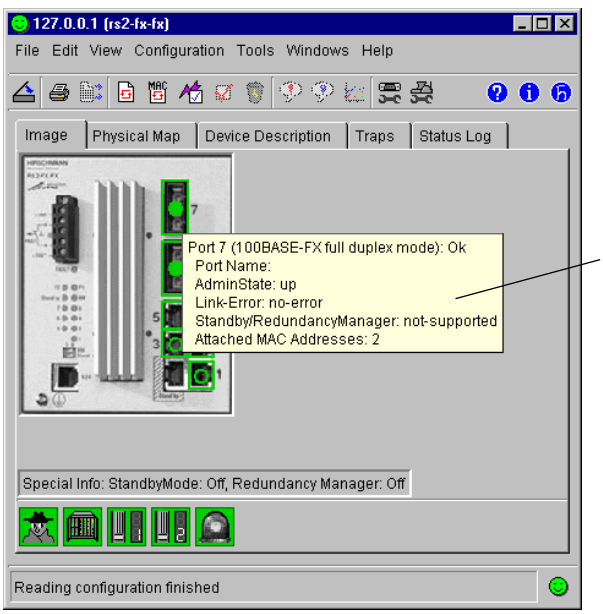
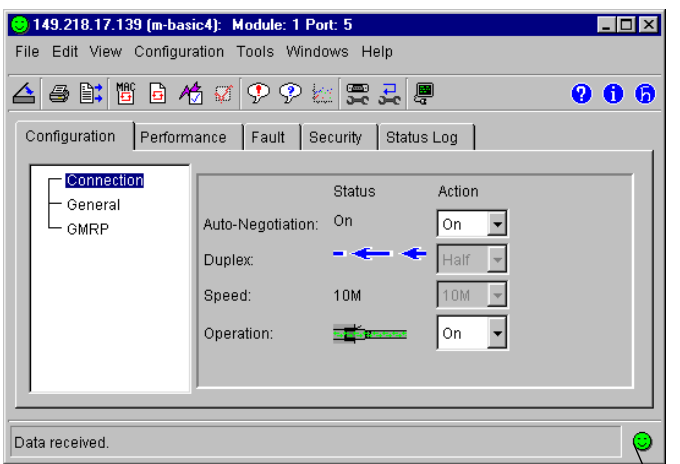


Fig. 3: Device window with MACH 3000 displayed

3.1.3 Detail window

Double-clicking a device detail in the device window (see Fig. 3) opens the associated detail window (see “Detail window” on page 121).



Menu bar
Tool bar

Card-index
for
- Configuration
- Performance
- Faults
- Security

Status bar

Pop-up device status

Fig. 4: Detail window after double-clicking a port icon

3.1.4 License window

Selecting `View:Module Licenses...` opens the license window.

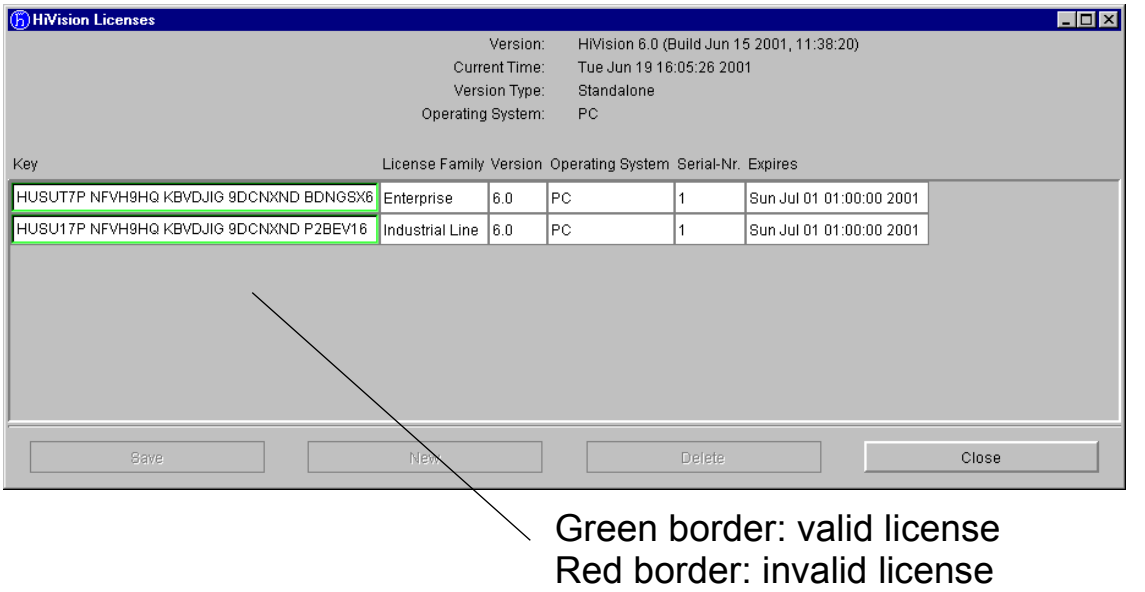


Fig. 5: License window

3.2 Using HiVision

3.2.1 Requirements

HiVision requires:

- An existing network concept
- The completed hardware installation of the devices to be managed
- The completed base configuration (such as IP parameters) of the devices to be managed, so that the network management station can communicate with the agents of the devices
- The completed SNMP community assignment of the devices to be managed, so that the network management station also has access to the agents
  SNMP controls access permissions to the agents. Every SNMP agent from Hirschmann has two tables:
  - User table
  - System table
  The user table defines who can access the agents with write and read permissions.
  The system table defines which computer, identified by IP address, can be used to access the agents.
  The Hirschmann agents have the following default configuration:
  `IP: *.*.*.*`, which means that every computer can be used to access the agents.
  Read permission with the `public` community
  Write permission with the `service` or `private` community

  Note: The network management station must be given write permission in the agent itself! Otherwise it will not be able to make any changes to the agent.

  Note: Protect your agents against unauthorized access by changing the default access permissions. Make a note of your changes and keep in a safe place.

3.2.2 Getting started with HiVision

Scan range (Stand-alone)

☐ Enter the IP-address range in which HiVision should search for agents. You can start the scan procedure by selecting `Edit:Rescan Entry`.

SNMP access permission

☐ Check the SNMP configuration.

Note: HiVision can only manage those agents that are displayed in this window (see Fig. 6) with valid read and **write permissions**.

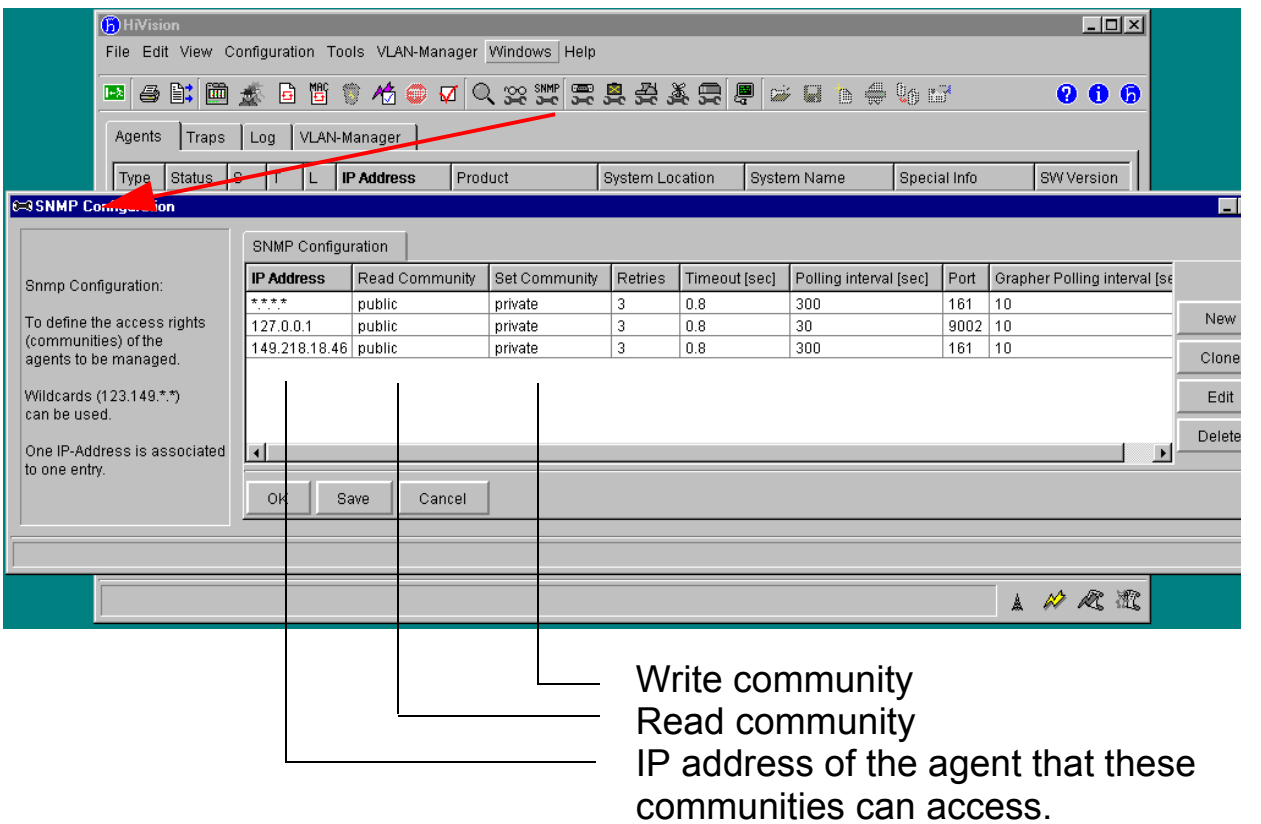

HiVision
File Edit View Configuration Tools VLAN-Manager Windows Help
Agents Traps Log VLAN-Manager
Type Status IP Address Product System Location System Name Special Info SW Version
SNMP Configuration
Snmp Configuration:
To define the access rights (communities) of the agents to be managed.
Wildcards (123.149.*.*) can be used.
One IP-Address is associated to one entry.
SNMP Configuration
IP Address Read Community Set Community Retries Timeout [sec] Polling interval [sec] Port Grapher Polling interval
**** public private 3 0.8 300 161 10
127.0.0.1 public private 3 0.8 30 9002 10
149.218.18.46 public private 3 0.8 300 161 10
New
Clone
Edit
Delete
OK
Save
Cancel
Write community
Read community
IP address of the agent that these communities can access.

Fig. 6: SNMP configuration

Device configuration

☐ In the detail window, configure the individual devices according to your network concept.

Network monitoring

☐ To customize your network monitoring, set the parameters for status propagation, trap threshold value, link monitoring, etc.

Network availability

Make sure to evaluate the following when network problems occur:

– Status propagation
The status propagation lets you track problems as far as the detail level. The pop-up information gives you the quickest overview of the most important situations.

– Statistics
The statistics can help you detect network problems before they occur, based on information such as a growing number of collisions, packet errors, etc.

– Traps
The event messages are triggered right after an event occurs, enabling the network administrator to act immediately.

4 "HiVision" main window

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The main window appears on the screen when HiVision is started. It consists of four parts:

- the menu bar
- the tool bar
- the card index, which provides information to the whole network with respect to the selected cardfile
- the status line

4.1 Menu bar

The menu bar is right at the top of the main window. It facilitates overall operation of HiVision. The main feature is the setting of the configuration and the view selection. Overall operation also includes programming and license administration not to mention quitting HiVision.

The menu bar has the following structure

```
File
   Print...
   Export...
   Exit


Edit
   Rescan[1]
   Rescan Range…[1]
   Stop scanning[1]
   Add agent…[1]
   Delete Agent
   Device Description…
   Multi Device Description…
   Multi Device Configuration…
   Agent Dialog…
   Update Agent
   Update MAC Address table
   Acknowledge Traps in Agent
   Acknowledge Status Changes
   Delete Trap
   Delete all Traps
   Delete Log entries
   Delete all Log entries


View
   Polling…
   Modul License…
   Product Families…
   Locate MAC Address…
```

1. All StandAlone solutions

Configuration
- Port Status Configuration…
- Interface Status Configuration…
- PowerSupply Status Configuration…
- Fan Status Configuration…
- Relais Status Configuration…
- Chassis Status Configuration…
- Network Configuration…[1]
- SNMP Configuration…[1]
- Configuration Assistant…
- Configure PSMs…
- Save selected agents to list
- Add selected agents to list
- Remove agent list

Tools
- Ping[1]
- Telnet
- SNMP Browser

VLAN-Manager
- Clear…
- Import stations
- Rescan agents
- Reload MAC tables
- Guess uplink…
- Agent list…
- Agent properties
- New…
- Delete
- Edit…
- Clone…
- Mgnt stations…
- Analysis
- Save
- Load
- Disable VLANS…
- Traps…

Windows

Help
- Program Info…
- Release Notes…
- Online Documentation…

1. All StandAlone solutions

4.1.1 Licenses

In normal HiVision mode, the license window is read-only.

NT versions

- ☐ In order to edit the license window, first quit HiVision and then log yourself in as administrator at the management station with write entitlements
- ☐ Start HiVision from the start menu:
  `Start:Program:Hirschmann:HiVision:Edit License`

Unix versions

- ☐ In order to edit the license window, first quit HiVision and then start HiVision as superuser with the option `-L`.

  HiVsion for HPUX and OpenView:
  `/opt/HiVision/bin/OVwHiVision -L`
  HiVsion for Linux:
  `/opt/HiVision/bin/HiVision -L`

The license window is opened.

Note: When a license key is edited, the appropriate field is highlighted in red. On correct entry of the last character of the license key, the background color changes from red to green.

Note: Each different HiVision release requires a different license key.

4.1.2 Status configuration

This menu item allows you to set various configurations for all devices. This means that the settings are transferred to all devices listed in the main window. This applies to both selected as well as non-selected devices.
The Configuration window displays all parameters that can be set in any device that can be displayed in the window. Devices that only support a limited number of parameters ignore the remaining parameters.

4.1.3 Status propagation

Status propagation specifies the color with which the selected object will be marked.

Color	Evaluation of Status
red	Error
yellow	Warning
green	OK
blue	unknown

Table 10: Color assignment for the possible conditions

Just how a status is evaluated is set in the configuration menu. These configuration settings apply for the surface in which they are activated.

A configuration setting made
- in the main window applies for the whole surface.
- in the device window applies for the whole device.
- in the detail window applies for the selected detail.
- on one level applies for all lower levels, when the field “overwrite” is checked.

Settings can be made for individual ports, interfaces or an interface card by means of the context menu (see page 123).

– The most recently set configuration supercedes the previous settings.
– A blue colored text line indicates a completed alteration.
– The arrow pointing down to the right in the left-hand window section indicates that the settings have been adopted by the higher level.
– The blue dot in the left-hand window section indicates that alterations have been made on this level (see Fig.1).

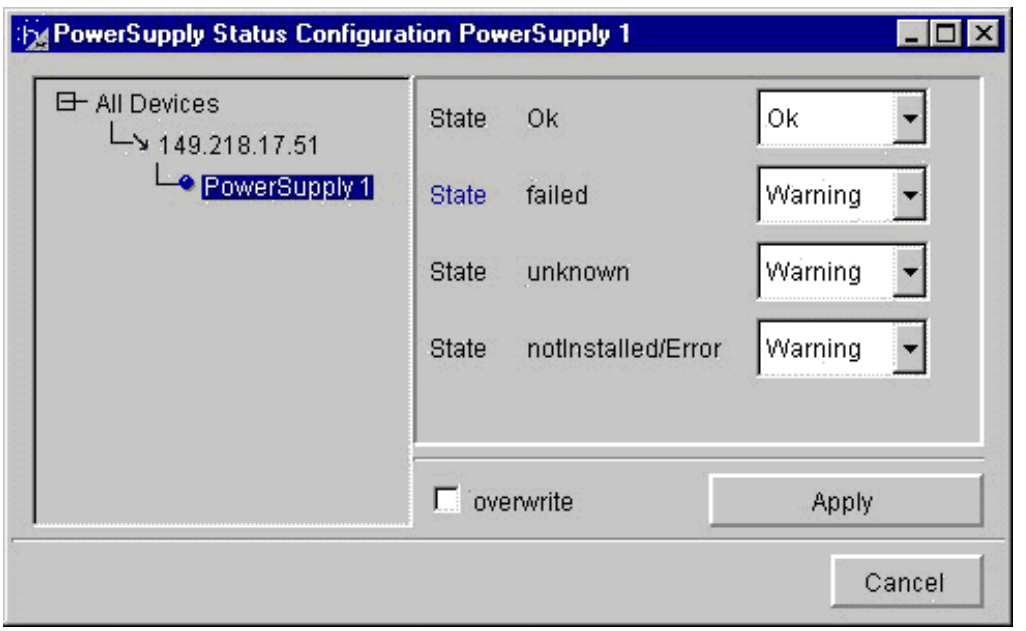

Fig. 7: Setting the status configuration

The most critical status color in each case is forwarded to the next highest level. If for example, the status color of a port is red, then the status symbol of the device, to which this port belongs, is also displayed in red.

The bubble help for this object shows:
– which configuration settings are relevant for an object,
– the current status of the object, which is reported to the management station.

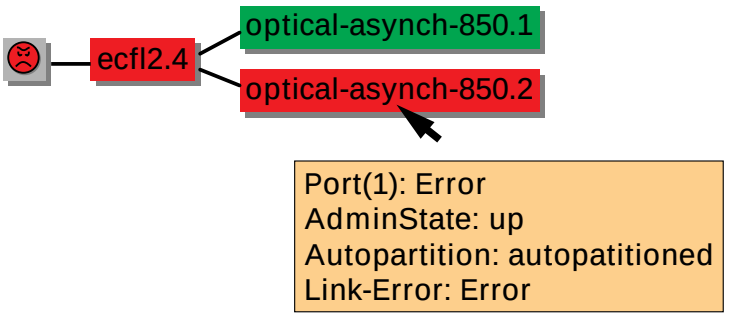

Fig. 8: Port status propagation

Example: A terminal device is directly linked to an optical port of the concentrator via a fiber optic cable.
When the terminal device is switched off, the optical port of the concentrator identifies a link error. The status of the `link error` is `error`. If the evaluation `error` has been assigned in the configuration menu, then the port is presented in the color red (see Fig. 8).
Since a deactivated terminal device does not as a rule represent a serious fault, a network administrator may less pay attention to this event. Therefore he may assign the status `link error` an evaluation free to his choice. If he assigns the evaluation `Warning` to the status `link error` the port will get yellow when the terminal device is switched off.

Status propagation to the management shell

HiVision propagates the determined status to the management shell, if:
- the setting for the symbol is set to “managed”,
- the status of the symbol is set to “Object” and additionally
- in IBM NetView the setting for the symbol is not set to “acknowledged”.

4.1.4 Telnet window

When a device symbol or in the device window, HiVision sets up a Telnet link to the selected device with `Tool:Telnet`.

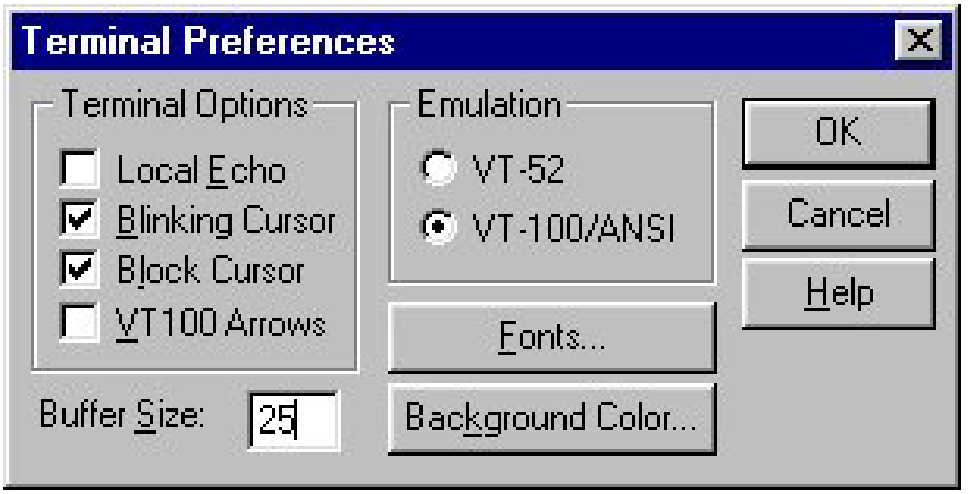

Fig. 9: Example of terminal settings with Windows NT

4.1.5 Agent Polling

The management station regularly interrogates the SNMP capability of administered devices. Polling prevents a device falsely appearing to be error-free when the SNMP link to the management station is interrupted.

- **Polling with the StandAlone version**
  The polling parameter is set under
  `Configuration:SNMP Configuration...`.

Polling with a platform-integrated version
The polling parameters are set with the platform menu `Options:SNMP Configuration`.

4.1.6 Locate MAC Address

This menu item helps you find certain MAC addresses.

☐ On the "Agents" filecard, select the agents to which you think the devices with the MAC addresses you are looking for are connected.

☐ In the menu bar, select `View:Locate MAC Address`.
A window shows the contents of the agent's Forwarding Database Table, provided it supports the MIB according to RFC 1493.

☐ Click on MAC Address in the header line to sort the table by MAC addresses.
Click the right-hand mousekey on the headline to open a search-window.

4.1.7 Network configuration

This menu item allows you to set the IP address range that HiVision scans in the connected network.

Saving the IP addresses found in the Agent list makes it possible for HiVision to look specifically for these addresses after HiVision is restarted. This makes HiVision start faster. Agents that are not found in the network, although they are in the Agent list, are displayed in red. In the status line HiVision displays the successfull loading of the agent list.

HiVision offers various ways to enter the Agent list:

- Save selected agents in list
  This command deletes existing entries from the Agent list and then saves the IP addresses of the agents selected in the main window in the Agent list.
- Add selected agents to the list
  This command adds the IP addresses of the agents selected in the Agent list.
- Remove agent list
  This command deletes all IP addresses from the Agent list. After restarting, HiVision scans the entire IP address range entered.

4.2 Tool bar

The tool bar is located just below the menu bar. It is provided to simplify operation. The tool bar makes it unnecessary to open the various windows in order to obtain a particular view.

List of functions in the tool bar:

`File:Exit`,
HiVision can also be exited by pressing the 'ESC' key.

`File:Print…` (with Windows)

`File:Export…`

Is equivalent to double clicking the selected line in the device list and opens the device window with detailed information on the device. This tool is useful where several lines have been simultaneously selected

`Edit:Multi Device Configuration...`

`Edit:Update Selected Agents`

`Edit:Update MAC Address table`. This causes the forwarding-database to be re-read from the switch.

`Edit:Delete Selected Traps…`

`Edit:Acknowledge Traps in selected agents`

`Edit:Stop scanning`

Edit:Acknowledge Status Changes

View:Product Families...

Configuration:Network Configuration…

Configuration:SNMP Configuration…

Configuration:Port Status Configuration…

Configuration:Interface Status Configuration…

Configuration:Power supply Status Configuration…

Configuration:Fan Status Configuration…

Configuration:Device Status Configuration…

Tools:Telnet…

VLAN Manager:Load…

VLAN Manager:Save…

VLAN Manager:New…

VLAN Manager:Delete…

`User groups:Duplicate...`

`VLAN Manager:Edit...`

`Help: Online Manual`, Manual (prerequisite is the previously completed installation of the Adobe Acrobat Reader 3.0)

`Help:Release Notes...`

`Help:Program info...`

4.3 Card index

The card index contains five filecards:

- Agent overview
- Trap
- Logbook
- VLAN Manager
- SyntaxChecker, if you started HiVision with a command-line parameter (see “Testing PSM” on page 235)

Multiple selection

Selection of several devices, which follow one another directly in the list:

- ☐ Select the first required device.
- ☐ Select the last required device with pressed shift key.
  =>All devices which are between these two devices in the list, are selected. Previously made selections are cancelled.

Selection of individual devices from previously made selections:

- ☐ Select an individual device with pressed Ctrl key.
  =>Changing the selection status of this device. Previously made selections remain unchanged.

Variable column width

Pressing the left mouse key when on a column line makes it possible to alter the column width.

4.3.1 Agent overview

This card provides a rapid overview of the SNMP agents for the whole network.
While starting in the StandAlone version HiVision displays the following devices:
– the devices of the agent list or
– the devices which are found from polling the agents of the network configuration.
In the platform-integrated version, HiVision adopts the symbols for the agents from the platform. Thus HiVision also displays devices which cannot be addressed during the program start.
Use the context menu for to view details on the individual devices. To open the context menu, click the device line with your right mouse button.

column topic
Click the column heading once and the card contents are sorted according to column topic.

HiVision provides regular (polling) of device details. The column "**S**“ indicates whether polling is activated for this agent.
Whereas the column "Status" displays the current device status, the column "S“ indicates whether the status has changed in the past.
Polling is active if the arrow around the bell is displayed.
Confirmation with `Edit:Acknowledge Status Changes`.
Polling is active when the arrow around the arrow is displayd.
Confirmation with `Edit:Acknowledge Status Changes` removes the color from the bell.

Depending on its configuration, an agent sends traps to the management station. A colored lightning bolt in the column 'T' indicates that at least one of the traps from this agent has been received. Confirmation with `Edit: Acknowledge Traps in selected agents` removes the color from the lightning bolt.

.HiVision is made up of a core program together with up to two modules. Each of the two modules supports a defined group of agents. A module is cleared by a valid license key.
An “x” in the column “**L**” shows that a valid license key has been installed for the module which supports this agent.

Note: If the product field for a device is empty then it is likely that
– the access right is not unique. HiVision always activates any IP address.
– the agent of the device is not licensed or
– the version number of the agent is not supported (see readme file).

Information is provided by the bubble help when the mouse pointer is positioned over the status symbol for the device.

If HiVision integrated in HP OpenView, then the column “M” is added to the agent overview.

M: An object can be assigned the status “unmanaged” in the management platform HP OpenView . No “x” in this column indicates that the agent has been assigned the status “unmanaged” and the status symbol appears in blue.

Search

The search function allows you to quickly find specific devices, IP addresses etc.
To open the context menu, click the column heading with the right mouse key.

4.3.2 Trap

This filecard shows all traps received from the management station.

HiVision evaluates traps and displays the effects in the individual windows.

One click on the column heading sorts the filecard contents according to column topic.

Selected traps can be deleted with the aid of the wastepaper basket in the tool list.

If the Log function is activated (see “Log files” on page 98) HiVision continually writes the contents of this window into a log file.

4.3.3 Logbook

This logbook documents irregularities in the network detected by HiVision using SNMP interrogation.

If you started HiVision with the command-line parameter `-ShowErrorLog`, HiVision will display other errors in addition to the SNMP-timeouts, for example fan state not readable.

If the Log function is activated (see “Log files” on page 98) HiVision continually writes the contents of this window into a log file.

4.3.4 VLAN Manager

The VLAN Manager filecard enables you to configure VLANs. For a detailed description of the VLAN-Manager, see “VLAN manager” on page 141.

4.4 Status line

The status line at the bottom of the main window is divided into two areas:

- Status messages
- Symbol area

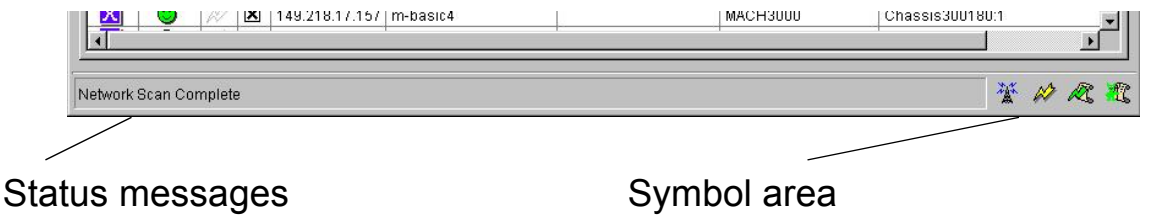

Fig. 10: Status line

4.4.1 Status messages

The status messages are shown on the left side of the status line. They show the current HiVision processes.

4.4.2 Symbol area

Note: When the mouse pointer is positioned over a symbol, a bubble help with an explanation of this symbol appears.

- **Data transmission**
  The symbols provide information between agents and HiVision.

  Note: When the lightning bolt in the trap symbol in the StandAlone version is crossed out, then start the Trapdaemon (see “Program start” on page 36 and “Program start” on page 42).

- **Platform change**
  With platform-integrated versions, an additional symbol makes it possible to change over directly to the platform.

- **Log files**
  These icons denote buttons. Click on an icon to activate or deactivate writing to the corresponding log file.
  When activated, HiVision writes the contents of the “Trap” on page 95 and “Logbook” on page 96 filecards to the appropriate log file.
  After 10,000 entries, HiVision closes the log file and saves it with the extension `.bak`. HiVision will write further entries to a new file.

5 Device window

5.1 Tool bar 103

5.2 Image 107

5.2.1 Device image 107
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5.3 Physical Map 109

5.4 Logical Map 111

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When a device line is double-clicked in the main window, the associated device window opens with the accompanying ip address and, if available, the device name in the head line.

In the managment shell there are additional possibilities to open the device window of a selected device:

- select `HiVision:OpenDevice` in the menu bar or
- select `HiVision:OpenDevice` with the right-hand mouse button in the context menu.

Note: If a device still does not appear in the main window of HiVision during initialization, an earlier entry can be induced via the management shell. To do so open the device window on the platform level with `HiVision:OpenDevice` in the context menu for the symbol.
In the context menu the line `HiVision:OpenDevice` is missing, if the shell has not identified the device as Hirschmann agent yet. To speed up identification close HP OpenView / IBM NetView and enter the following lines:

```
ovstop
ovstart ovwdb
ovw -fields
ovstart ovtopmd
ovtopofix -u
ovstart
```

Restart HP OpenView.

The device window consists of a menu line, the tool bar, a card index with five cards and the status line. The card index has 6 cards:

- Image
- Physical map
- Logical map (MIKE and MultiMIKE agents)
- Device info
- Trap
- Status log

The status line is highlighted with the symbol on the right. The color and the term show the status of the whole device:

Ok

Warning

Error

Note: The states of the symbols are determined when the device window is opened.
The content of a device window is updated:
- when the interface cards equipment is changed
- after `View:Reload`
- when a trap with content which affects the symbol color is received.
- when the MAC address table is reloaded.

5.1 Tool bar

The tool bar is located just below the menu bar. It is provided to simplify operation. The tool bar makes it unnecessary to open the various windows in order to obtain a particular view.

List of functions in the tool bar:

`File:Exit`, closes the window

`File:Print...`

`File:Export...`

`Edit:Update MAC Addresstable`, reads in the forwarding database of the switch.

`Edit:Update Selected Agents`

`Edit:Acknowledge Traps in selected agents`

`Edit:Acknowledge Status Changes`

`Edit:Delete Selected Traps...`

`View:Set`, data transmission to the agent

`View:Reload`

`Configuration:Port Status Configuration...`

`Configuration:Interface Status Configuration...`

`Configuration:Power supply Status Configuration...`

`Configuration:Fan Status Configuration...`

`Configuration:Device Status Configuration...`

`Tools:Telnet...`

`Help: Online Manual`, Manual (prerequisite is the previously completed installation of the Adobe Acrobat Reader 3.0)

`Help:Release Notes...`

`Help:Program info...`

Extended tool menu bar for VLAN configuration:

VLAN:Load VLAN configuration...

VLAN:Save VLAN configuration...

VLAN:New station..., for future extensions

VLAN:Create VLAN...

VLAN:VLAN Membership...

5.2 Image

The filecard “image” shows a representation of the corresponding device with its actual setup. The card is subdivided into two areas:

- the device image
- the subdevice buttons

5.2.1 Device image

The device image shows the gray scale image of the relevant image with its current equipment.

Color symbols
The ports are overlayed color symbols. The status of the port is indicated by the color as well as the form of the symbol:

nothing is connected to this port

○ a single device is connected to this port

● this port is linked to several devices
“MAC addresses” on page 109.

The significance of each color corresponds to the color assignment (see Table 10 on page 82) .

Bubble help
When the mouse pointer is positioned on certain device parts, the associated bubble help appears. It contains the most important status information.

5.2.2 Subdevice buttons

The subdevice buttons below the device image show symbols for parts of the device, which may not be visible from the front of the device.

- **Colored border**
  The symbols have colored borders.
  The significance of each color corresponds to the color assginment (see Table 10 on page 82) .

- **Bubble help**
  When the mouse pointer is positioned on certain device parts, the associated bubble help appears. It contains the most important status information.
  The bubble help for the symbol indicates the logical, physical and SNMP states.

- **Net number**
  “all” is the default. This means that all possible colored symbols are superimposed at the ports on the device image.

  Note: When a particular net number is selected, then symbols are just superimposed on those ports associated with the selected net number.

  Note: The net number function is supported by ETS-12/24TP/M, ETPS-22TP/M and all AMC devices. With all other devices, the setting “all” is required to display the colored symbols.

5.3 Physical Map

This index card shows a representation of the physical device in tree structure. It enables the cause of a status change to be identified.

Example: A link error occurs at a twisted pair port. Thereupon the status symbol of the affected device goes red. A quick glance in the map shows immediately which port is causing the status propagation.

- **Bubble help**
  When the mouse pointer is positioned on certain device parts, the associated speech bubble appears. It contains the most important status information.
  The bubble help for the symbol indicates the logical, physical and SNMP states.

- **MAC addresses**
  The MAC addresses are listed in addition to the port symbols. These MAC addresses are associated with the devices, which are connected to this port. If several devices are connected to one port, then three dots appear in this field. You will obtain a list of all MAC addresses by selecting “Security” with the right-hand mousekey on the port (see page 123).
  Special case TYDE and IYDE: The MAC addresses of all attached devices are displayed at Port 1.

- **IP addresses** (with platform of integrated version)
  The MAC- and IP-addresses are listed in addition to the port symbols. These addresses are associated with the devices, which are connected to this port. If several devices are connected to one port, then three dots appear in this field. You will obtain a list of all addresses by selecting “Security” with the right-hand mousekey on the port (see page 123).

- **Net number** (with Agent MIKE/MultiMIKE)
  The display and setting option for the net number assignment is located next to the addresses. You will require a community with write-entitlement to change the net number assignment.

5.4 Logical Map

This card represents the logical design of MultiMIKE agents. The assignment of port to interface is immediately recognizable. HiVision fetches RMON 1 (Statistics) and 2 (History) at the interface level.

- **Bubble help**
  When the mouse pointer is positioned on certain device parts, the associated bubble help appears. It contains the most important status information.
  The bubble help for the symbol indicates the logical, physical and SNMP states.

5.5 Device information

The filecard indicates the configuration of the agent.

“Reload”: reloading from the agent MIB and updating the display

“Set”: fields with a white background can be edited. “Set” writes the indicated values into the MIB of the agent.

5.6 Trap window

The card shows the traps received by this agent.

Traps are distinguished according to their origin:

- Generic
  The trap is defined in a standard MIB. Following traps are possible:
  - `coldStart`,
  - `warmStart`,
  - `linkDown`,
  - `linkUp`,
  - `authenticationFailure`,
  - `egpNeighborLoss`.

  If we are dealing with an enterprise-specific Trap, the entry in the column `Generic` is `enterpriseSpecific`.
- Enterprise
  The trap is defined in an enterprise MIB.

5.7 VLAN configuration

With the switches FES-24TP Plus, GES-16FX and GES-24../2SX with VLAN function, the device window also offers the file card "VLAN configuration" and the menu item "VLAN", with the following sub-items:

```
New station...
Delete station(s)
VLAN Membership...
Create VLAN...
Delete VLAN...
Load VLAN configuration...
Save VLAN configuration...
```

Port number and VLAN assignments can be set with the aid of the context menus from a selected item.
Dubble clicking on a port symbol displays the port VLAN dialog.

Note: With `VLAN:Save VLAN configuration...: in agents`, the agent accepts the adopted settings as long as they fall within its scope of functions.

Note: All settings, including those that extend beyond the function range of an agent, can be saved to a file with
`VLAN:Save VLAN configuration...:to file`.

5.8 Status log

The "Status log" card index lists the status changes. In addition to the message indicating which event caused the status change, HiVision also stamps the time the time the change was made.
HiVision collects all status changes in this window -- those of the entire device as well as the device details (see “Detail polling” on page 134).

6 Detail window

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6.2.2 RMON function 131
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Detail windows can be opened within the device window (image, physical structure and logical structure cards) or at interface-card level, port level and interface level or with a chassis, power supply unit or fan symbol. A drop-down menu is opened with the right hand mousekey on a device detail. The selection of the required topic opens the appropriate detail window.

Depending on the device detail, the following topics are available:

- Configuration
- Performance
- Fault
- Security
- Accounting
- Polling

Each topic represents a card index in the detail window. If a detail window is open, then it is possible to switch directly to the next topic via the card selection.

When a detail window is opened, HiVision polls the current values at the agent. Attributes not supported by the agent are displayed by HiVision in red.

6.1 Tool bar

The tool bar is located just below the menu bar. It is provided to simplify operation. The tool bar makes it unnecessary to open the various windows in order to obtain a particular view.

List of functions in the tool bar list:

`File:Exit`, closes the window

`File:Print`... (with Windows)

`File:Export`...

`Edit:Update MAC Address table`. This causes the forwarding database to be re-read from the switch.

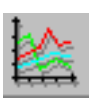
`Edit:Update Selected Agents`

`Edit:Acknowledge Traps in selected agents`

`Edit:Acknowledge Status Changes`

`View:Set`, data transmission to the agent

`View:Reload`



Graphical or tabular presentation of selected counters in the SNMP monitor

Properties of a table entry

Recreate table entry

Delete selected table entry

Stop loading procedure for a table

`Tools:Telnet...`

`Configuration:Device Status Configuration...`

`Configuration:Power supply Status Configuration...`

`Configuration:Fan Status Configuration...`

`Configuration:Port Status Configuration...`

`Configuration:Polling configuration...`

`Help: Online Manual`, Manual (prerequisite is the previously completed installation of the Adobe Acrobat Reader 4.0)

`Help:Release Notes...`

`Help:Program info...`

6.2 Information presentation

You receive detailed information of the device at all levels, e.g. chassis, card, port, power supply and fan level.
For this the Hirschmann agents put a whole series of counters and tables. This allows an analysis of network events down to the layer 1 of the ISO/OSI base reference model. The extensive configuration possibilities permit an individual customization to your own network environment.

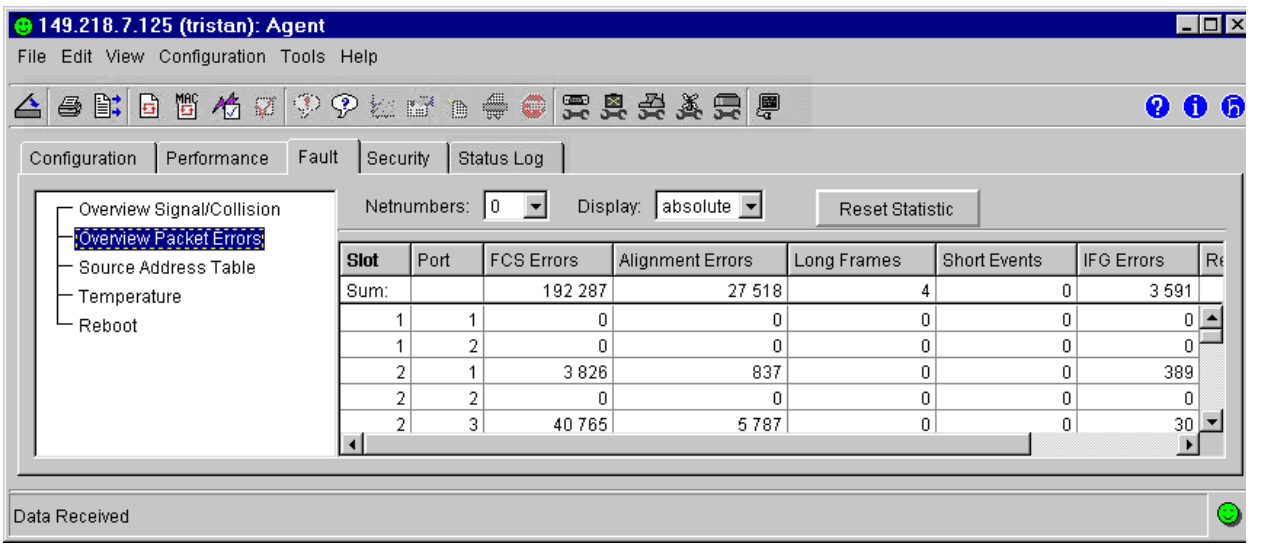

149.218.7.125 (tristan): Agent
File Edit View Configuration Tools Help
Configuration Performance Fault Security Status Log
Overview Signal/Collision
Overview Packet Errors
Source Address Table
Temperature
Reboot
Netnumbers: 0
Display: absolute
Reset Statistic
Slot Port FCS Errors Alignment Errors Long Frames Short Events IFG Errors
Sum: 192 287 27 518 4 0 3 591
1 1 0 0 0 0 0
1 2 0 0 0 0 0
2 1 3 826 837 0 0 389
2 2 0 0 0 0 0
2 3 40 765 5 787 0 0 30
Data Received

Fig. 11: Example for the display of a fault counter

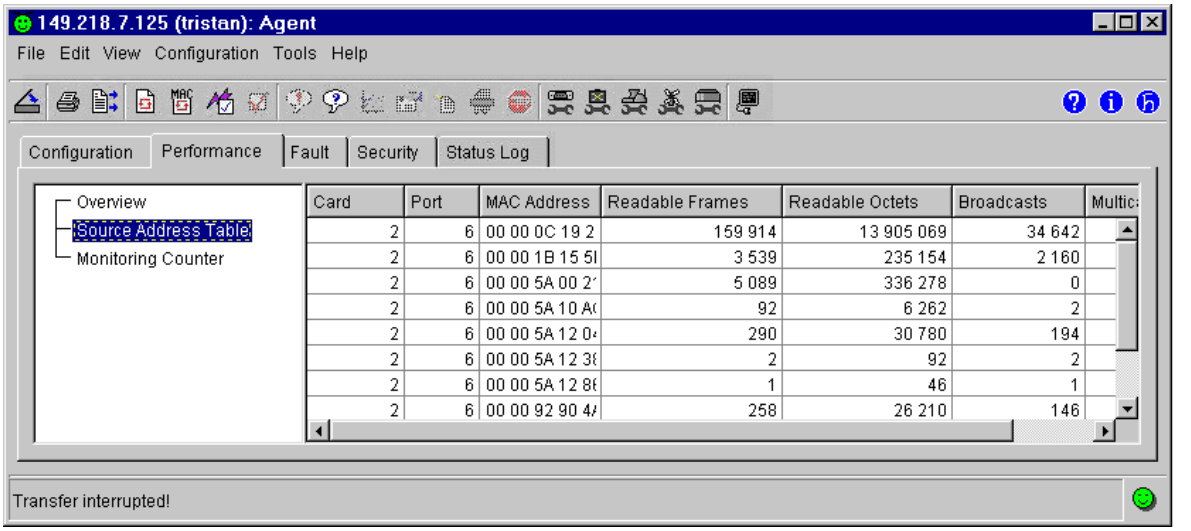

149.218.7.125 (tristan): Agent
File Edit View Configuration Tools Help
Configuration Performance Fault Security Status Log
Overview
Source Address Table
Monitoring Counter
Card Port MAC Address Readable Frames Readable Octets Broadcasts Multic
2 6 00 00 0C 19 2 159 914 13 905 069 34 642
2 6 00 00 1B 15 5I 3 539 235 154 2 160
2 6 00 00 5A 00 2' 5 089 336 278 0
2 6 00 00 5A 10 A(92 6 262 2
2 6 00 00 5A 12 0(290 30 780 194
2 6 00 00 5A 12 3(2 92 2
2 6 00 00 5A 12 8(1 46 1
2 6 00 00 92 90 4(258 26 210 146
Transfer interrupted!

Fig. 12: Example for the display of source address related counters on chassis level

6.2.1 SNMP monitor

A graphical representation of the counter values makes it easier to interpret the values.

☐ Select the desired variables to be graphically displayed in the port window of either the "Performance" or "Fault" card .
☐ Click "Grapher" in the tool bar.

Setting

Under `Edit:Preferences...` you will find entry fields for the:
– Log to file
– Path name of a log file
– Polling interval. When starting the Grapher, it accepts the value that has been set under
`Configuration:SNMP Configuration`
– Duration of the data storage.

Representation

The SNMP monitor provides the table values. The following display options are available:
– Line diagram or bar diagramm,
– Pie chart and
– Table.
In the line/bar diagram you can change the horizontal scale with `Zoom in` and `Zoom out`. To enlarge the scale, click the scroll bar at the top or bottom and drag it in a vertical direction.

Note: To be able to use the Grapher you must first install Java (ver. 1.2 or 1.3).

Note: HiVision offers this Grapher function in the PC stand-alone version. To also use this Grapher with a platform-integrated version, start HiVision with the command-line parameter
-JavaGrapher (-jg)

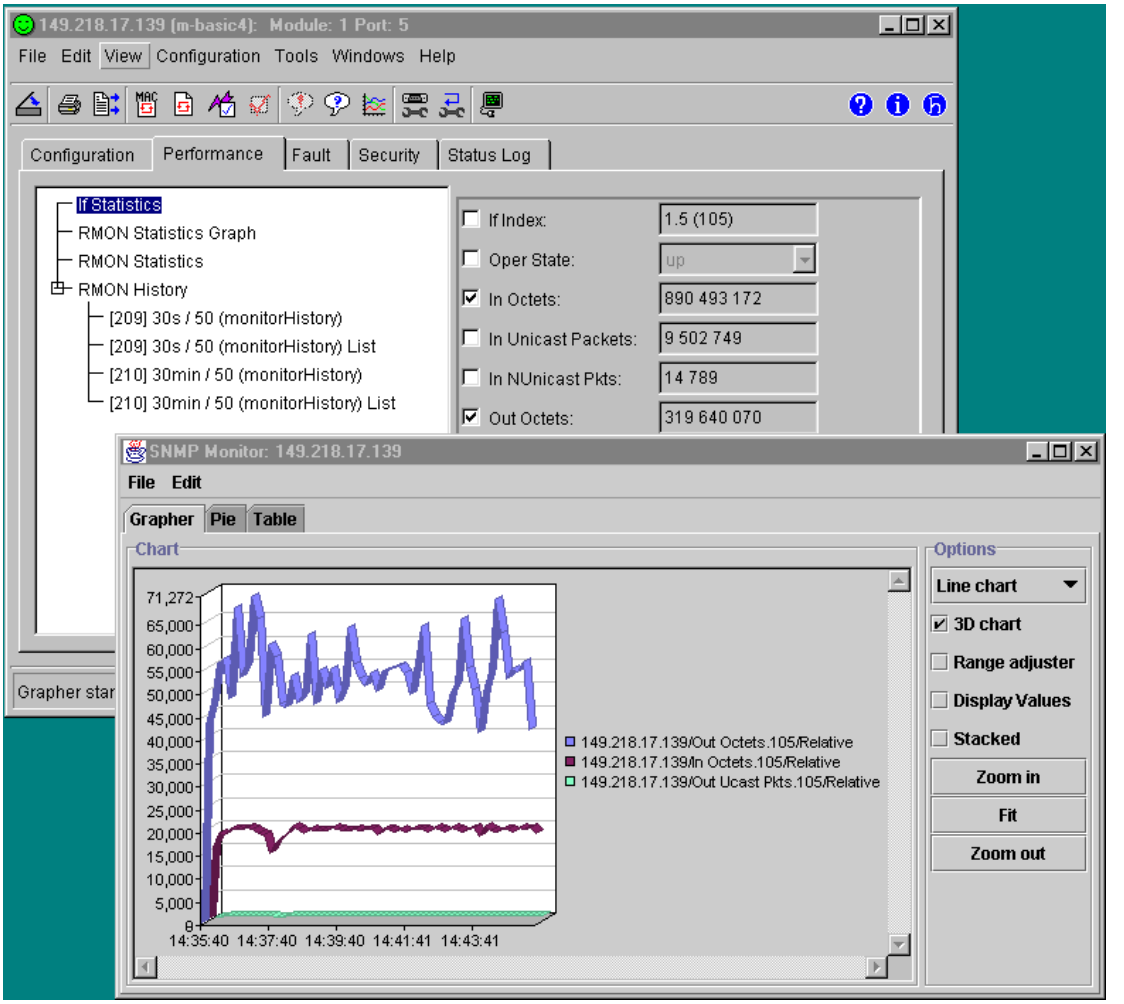


Fig. 13: Example for the display of the performance on port level with graphic representation (platform version)

Log files

The Grapher offers two methods for creating log files:

– `File:Save...` saves the table contents as a text file.
– `Edit:Copy` copies the table contents onto the (Clipboard).

6.2.2 RMON function

So that information can also be presented by non-Hirschmann devices, HIVIsion supports parts of the standardized RMON Management Information Base.

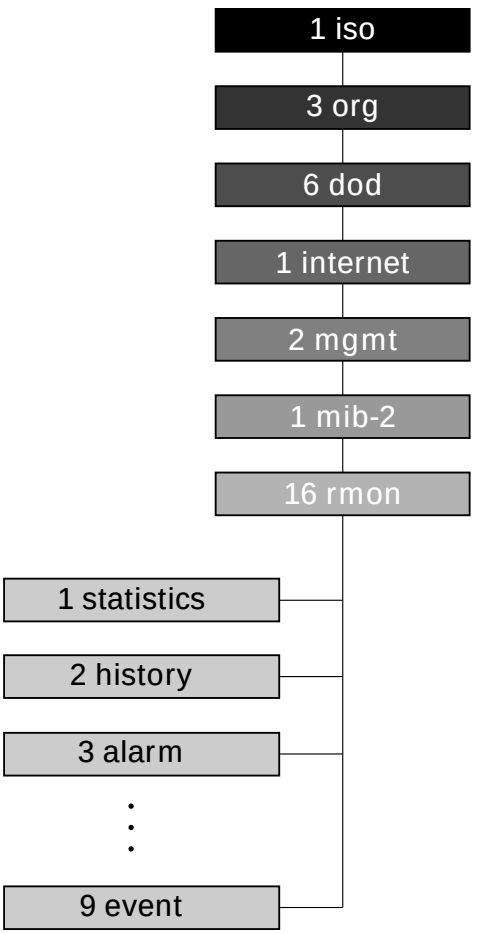


Fig. 14: Tree structure of the RMON-MIB

Polling with RMON 1 and 2 always takes place at a device interface. HiVision presents device interfaces of Hirschmann switches in the "Physical structure". For all other agents, the device interface is presented in the “logical structure” in the device window (see “Logical Map” on page 111). Switches directly link interface and port. RMON 1 and 2 are therefore also available at port level.
Configuration of alarms and eventsfor any variables (RMON 3 and 9) takes place at chassis level.

Note: So that RMON 1 and 2 is available on HiWay Switches of the types ETS-14TP, -30TP, -16TP Plus, -32TP Plus,
FES-08TP Plus, -16TP Plus and -16TP , activate the RMON Ethernet statistics table and the RMON history control table on the device by means of Telnet. Enter `snmp/etherstattbl` and
`snmp/histcntrltbl` after logging in.

Note: In order to make RMON 2, 3 and 9 functions available, you will require write entitlement for the agent.

Example of generation of an alarm with assistance from RMON

In the following example, the fan speed of a concentrator should be monitored. As the concentrator is being operated in a very warm environment, the fan function is very important. If the fan speed drops too low, the concentrator could overheat. Therefore the alarm is to indicate if the fan speed drops below the set value of 1200.
The choice of configuration in the agent symbol context menu opens the agent window (see Fig. 15).
The choice of an RMON alarm in the filecard configuration indicates the adjustable parameters.
The "Fan" window is opened by selecting "Error" from the context menu of the fan symbol in the device window. The MIB variable can be entered simply by moving from "Fan" to the 'MIB Variable' field of the agent window with the mouse button pressed (drag and drop).
The MIB variable for the fan speed is (see Chap. 6, MultiMIKE manual):
`1.3.6.1.4.1.248.4.2.1.5.1.3.1.1`
The sampling rate can be adjusted with a sliding controller.
When the status is “active”, the alarm is activated with `View:Set`.

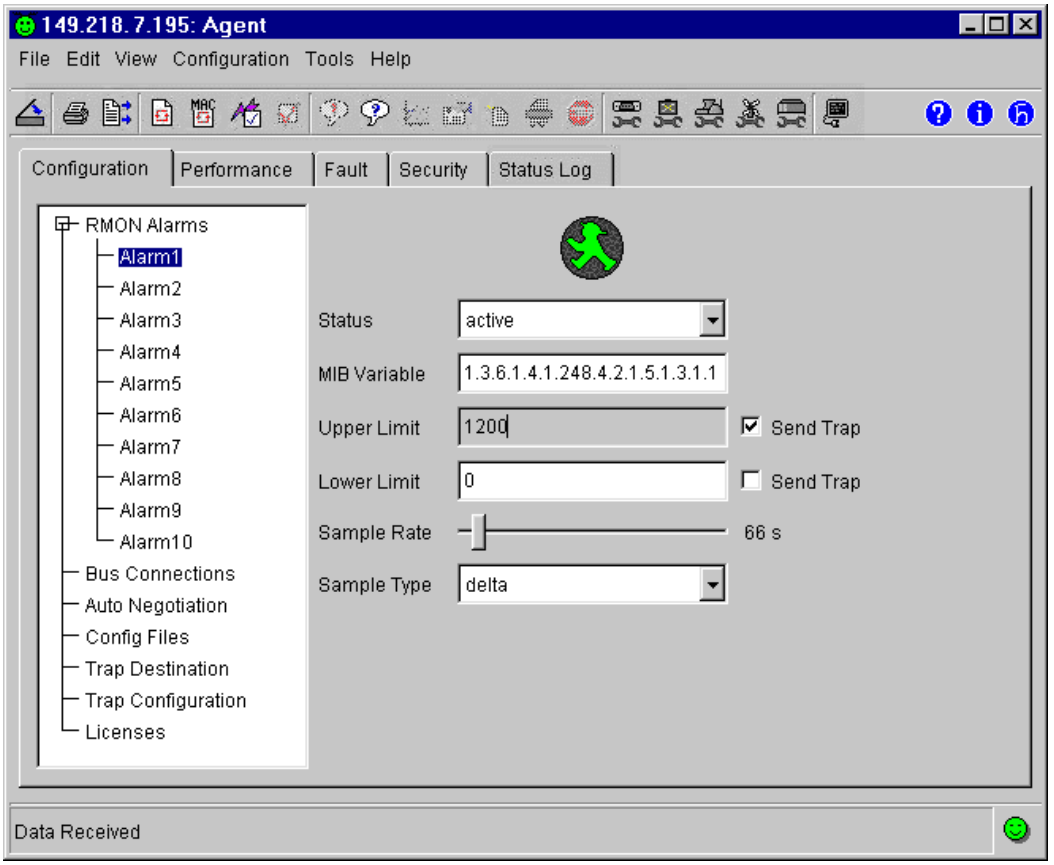


Fig. 15: Setting an RMON alarm

6.2.3 Detail polling

Detail polling allows the following statuses to be polled on a regular basis:
– Port status
– Power supply status
– Fan status
– Housing status
– Relay status and
– Statuses of symbols for device functions defined in the PSMs.
During the polling process, HiVision polls all the information required for calculating the status. These informations are displayed in the status configuration window on detail level.

☐ To activate/deactivate and set the polling interval, select `Configuration:Polling Configuration...`in the Detail window
HiVision saves this configuration immediately afterward and reloads its when the program is restarted.

The "Status log" card lists the status changes. Apart from the message indicating which result led to the change in status, HiVision also stamps the time of the change.

For an overview of all active detail pollings, go to `View:Polling...`in the main window.
This table displays:
– The current status,
– The worst status to date (similar to a peak level indicator)
– The IP address of the polling target,
– The function type
– The polling detail and
– The polling interval.
By double-clicking a line in the table, you will be taken directly to the "Status log" card of the polling target.
You can tell whether detail polling has been activated according to what appears in the "S" column. In addition to the symbol, the speech bubble help for the symbol also provides information.

6.2.4 Rack Monitoring System

The Rack Monitoring System employs a two-dimensional array to represent the sensors. The action `View: Reload` updates the values in the "sensors" file card.
The proper representation of the sensor symbol depends on the name of the sensor. To name a sensor, click the physical structure of a sensor with the right mouse button and select "Configuration".
HiVision expects the following character sequence

`door`: door contact
`ups`: uninterruptable power supply
`smoke`: flue gas detector
`vibration`: vibration detector

Example of a name for a flue gas detector: "Smoke in storage space" or "Storage space smoke".

6.3 Configuration settings

6.3.1 Filter settings of the RMS

The filter settings can be accessed via the context menu of a Rack Monitoring System agent. Using the right mouse button, click the agent symbol within the physical structure and select 'configuration'. The RMS offers 12 filter options.

Example: If temperature sensor 3 measures more than 40°C, then a trap should be sent.
Procedure:

- ☐ Click `Filter` in the left-hand list
- ☐ Double-click a filter option (e.g., 12). The `Filter` window will open.
- ☐ Change the appropriate settings in the `Filter` window.

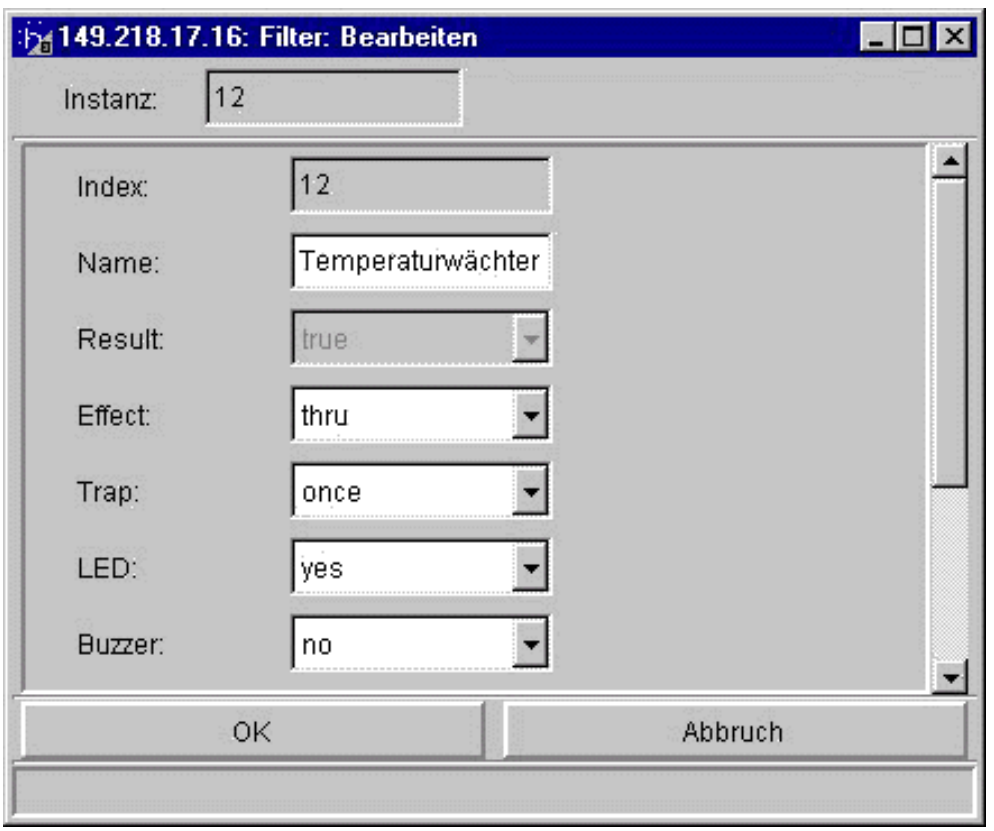


Fig. 16: RMS filter settings

☐ Close the `Filter` window with "OK"
☐ Click `Filter Temperature` in the left-hand list.
☐ Double-click the line `Filter Index 12, Sensor 3`. The `Filter Temperature` window will open.
☐ Change the appropriate settings in `Filter Temperature`

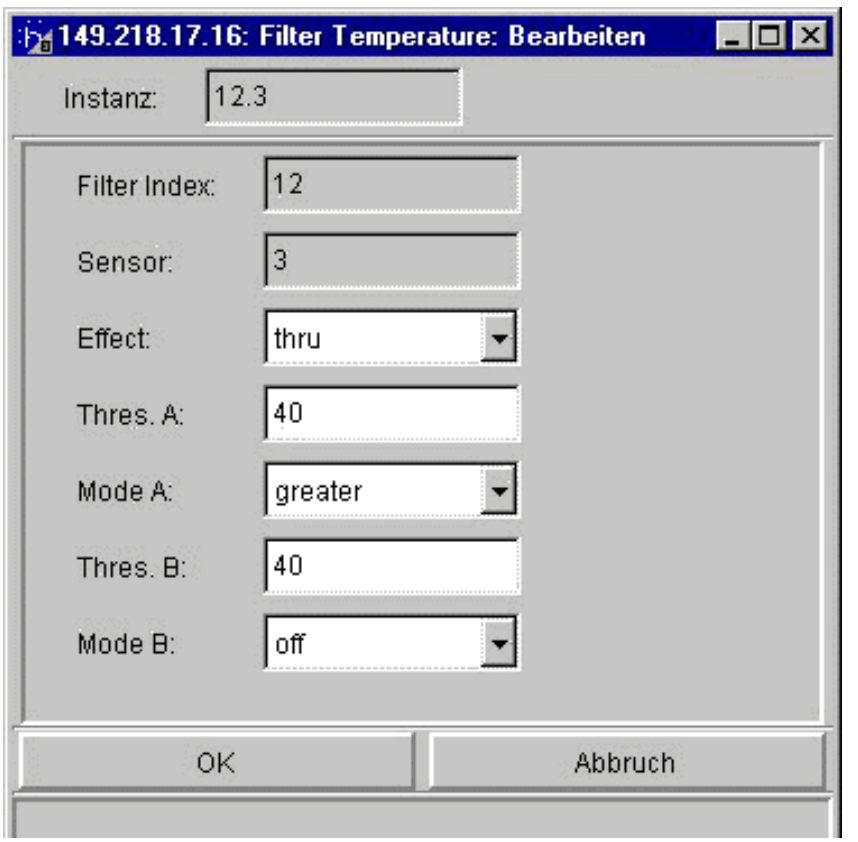


Fig. 17: RMS Filter condition

☐ Close `Filter Temperature` window with 'OK'

6.3.2 GLS and ALS parameter setting

Communication of the management station with a GLS or ALS agent has no direct effect on the hardware of the interface cards.
Configuration settings are adopted by the hardware following a reset. Click the relevant interface card with the right mouse button and select "Error" in the context menu. Select `Execute` under "Reset" and click the "Set" button.

6.3.3 Switch configuration

The starting point for setting bridge/switch parameters is the device window for a bridge or switch.
To open the configuration detail window, click an agent icon with the right mouse button and select Configuration in the shortcut menu.

- **Dual homing (MACH 3000)**
  The left half of the configuration detail window contains the option list for the possible configuration parameters.
  - ☐ Select "Dual Homing". The dual-homing parameters appear on the right side of the window.
  - ☐ Click the "New" button on the tool bar. The window for creating a dual-homing entry appears.
  - ☐ Enter an existing board and existing port, and confirm with "OK". The entry appears as a dual-homing parameter row on the right side of the window.
  - ☐ Double-click this row. A window for entering the rest of the dual-homing parameters appears.

  Note: Enter a value of 0 for the `PortRevivalDelay` parameter, or a value greater than `60000` with Spanning Tree active, or greater than `10000` with Spanning Tree deactivated.

GARP (MACH 3000)

The line `Priority Port GARP` is located in the selection list in the left half of the Configuration Detail window. This line is for setting the parameters of the Generic Attribute Registration Protocols.
With the help of these parameters the experienced network administrator can influence how often GARP data packets are sent in large networks. In most cases, the default values provide a reliable exchange of VLAN data between the MACH 3000 devices.
The default values are:
– Join time: 20
– Leave time: 60
– Leave all time: 1000

GVRP - GARP VLAN Registration Protocol (MACH 3000)

The line `Switching General` is located in the selection list in the left half of the Configuration Detail window. This line is for activating and deactivating the GARP VLAN Registration Protocol. This protocol describes the distribution of VLAN information to other switches. This makes it possible for switches to learn the information of other VLANs. If the VLAN information is to be distributed to neighboring devices, the GVRPs must be activated globallly.

☐ Proceed by selecting `enable` für `GVRP Status` on the right side of the Configuration Detail window.
☐ To activate GVRP really select additionaly in the port window `VLAN Port` the G`VRP Status`.

GMRP – GARP Multicast Registration Protocol

The line `Switching General` is located in the selection list in the left - half of the Configuration Detail window. This line is for activating and deactivating the GMRP. The GARP Multicast Registration Protocol (GMRP) describes how multicast information is distributed to other switches. This makes it possible for switches to learn multicast adresses. When entering a multicast address in the statistical address table, the switch sends this information to all ports. Connected switches learn how to forward this multicast address to this switch.

☐ Proceed by selecting `enable` for `GMRP Status` on the right side of the Configuration Detail window .
☐ To activate GMRP really select additionaly in the port window G`MRP`.

7 VLAN manager

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To create and manage VLANs you must first have worked out a VLAN concept.
VLANs can also be configured virtually, which means that configuration can take place in HiVision before the final hardware installation of the devices.

7.1 The function of the VLAN manager

7.1.1 Advantages of the VLAN manager

The VLAN Manager provides three big advantages:

- Fast configuration of VLANs
  - Unique multi-device configurations
  - Simultaneous configuration of multiple stations, groups, ports and security settings.
- Safe configuration of VLANs
  The VLAN Manager checks the configuration before transferring it to the agents. If the configuration is inconsistent the VLAN Manager will indicate the problem.
  A configuration installed in the network can be loaded (provided there is at least one MACH 3000 with a MAC-based configuration in the network).
- Documentation of VLANs
  Using the export function the configuration can be exported to a file as a table or as an HTML file.
  The file can then be read by other documentation programs.

7.1.2 Configuration types

The VLAN Manager differentiates between two types of configuration:

- Non-intersecting configuration
  A non-intersecting configuration is where there is no overlap between various groups of stations. Each station belongs to one group only. Each group has only one VLAN identification (VLAN ID). In this case each group is also a VLAN (see Fig. 18).
  HiVision assigns each VLAN a VLAN ID and enables the administrator to assign VLAN IDs himself.

Example applications for a non-intersecting configuration:
– Restricting broadcasts in IP subnetworks
– Strict separation of VLANs within a network

- Intersecting configuration
  An intersecting configuration is where various groups of stations overlap. One or more stations can belong to more than one group (see Fig. 18). In this case stations in a group can belong to VLANs with different VLAN IDs.

  Example applications for an intersecting configuration:
  – Restricting broadcasts in IP subnetworks
  – Secure access for different groups to a single server

Properties	dot1q	GRS	GES	MACH 3000
Port-based, non-intersecting	x[1]	x	x	x
Port-based, intersecting	x[1]	-	x	x
MAC-based	-	-	-	x
Port security	-	-	-	x

Table 11: Device support for VLAN properties

1.The programming of non Hirschmann devices by the VLAN manager depends on the implementation of the dot1q-MIB in these devices

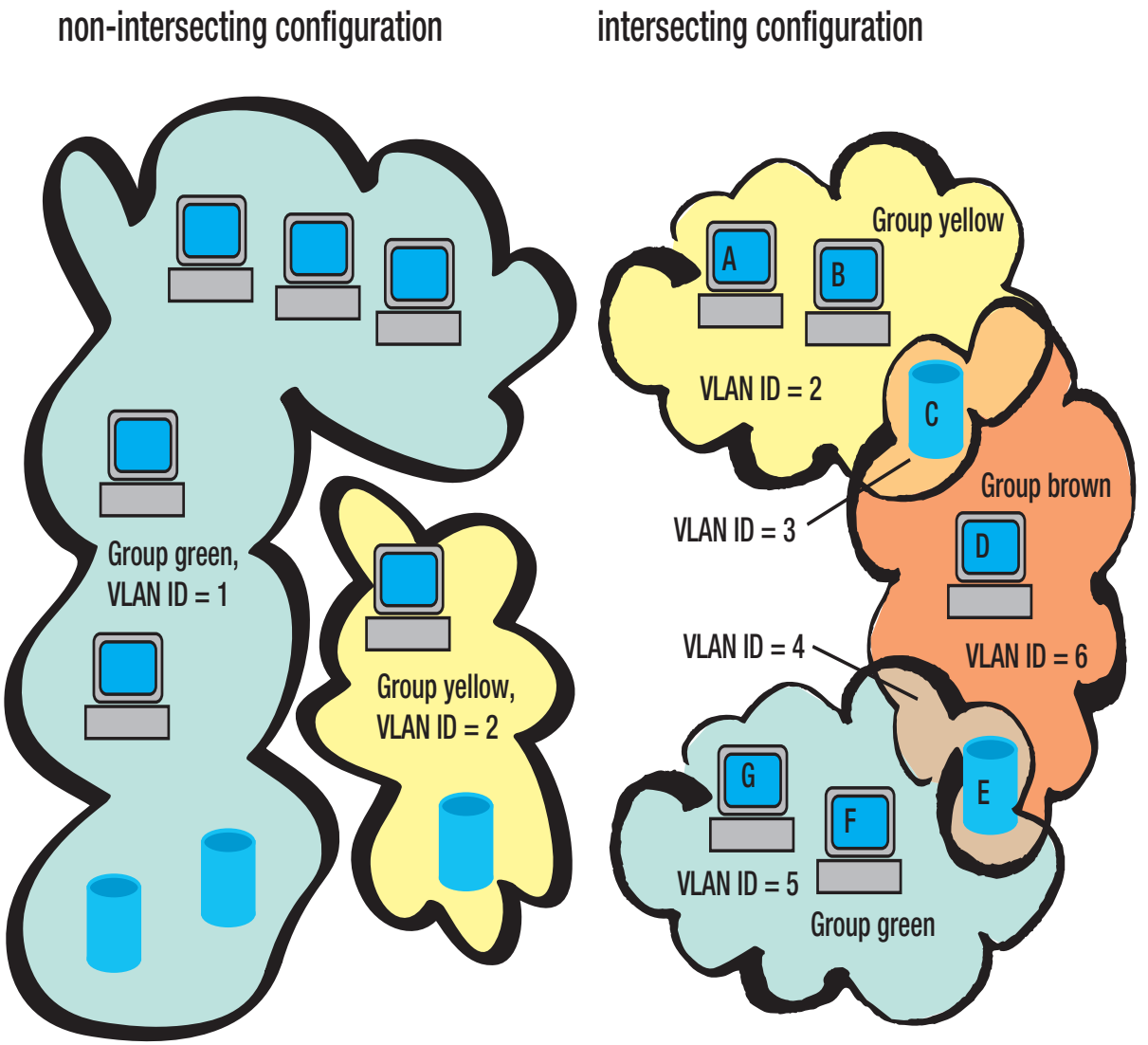

Fig. 18: Non-intersecting and intersecting configurations

7.1.3 Data entry elements

The program provides numerous data entry elements to help you configure VLANs.

- Filter
  Using the filter function you can reduce the number of lines in the table below the filter box. The filter function affects the left column in the table. Enter the required sequence of characters in the filter box and click the filter button. The table will then only show those records which contain the sequence of characters you entered.

- Search function
  To search for particular entries in a table, right-click on a field in the header line.
- Edit field
  Double-click a field in a table to edit it. HiVision will then open the appropriate window.
- Shortcut menu
  Right-click on a field in a table to open a shortcut menu to help you edit it.
- Sort function
  Click on a field in the table header line to sort the table.
- Simultaneously editing several lines
  Use "Ctrl" or the "Shift" key to select several lines in a table for editing. HiVision enters the modified values in all the selected lines. Fields marked `ignore` remain unchanged.

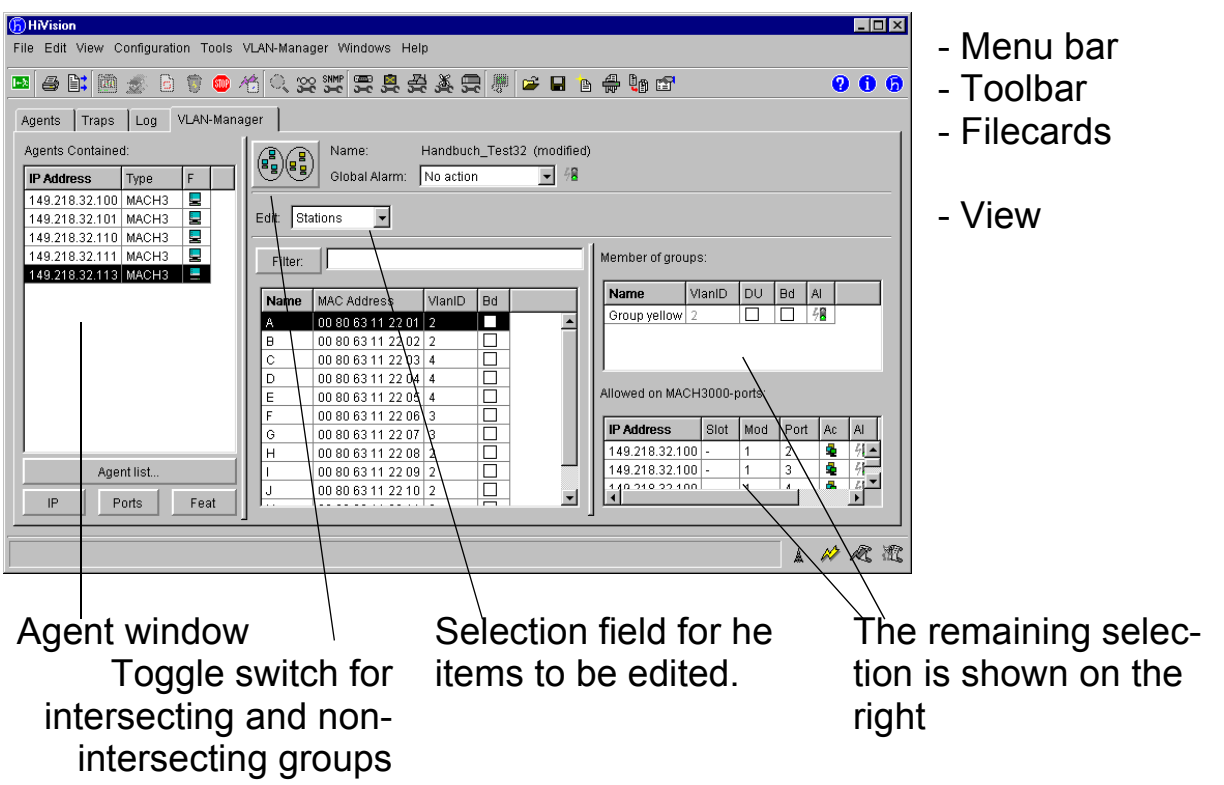
HiVision
File Edit View Configuration Tools VLAN-Manager Windows Help
Agents Traps Log VLAN-Manager
Agents Contained:
IP Address Type F
149.218.32.100 MACH3
149.218.32.101 MACH3
149.218.32.110 MACH3
149.218.32.111 MACH3
149.218.32.113 MACH3
Agent list...
IP Ports Feat
Name: Handbuch_Test32 (modified)
Global Alarm: No action
Edit: Stations
Filter:
Name MAC Address VlanID Bd
A 00 80 63 11 22 01 2
B 00 80 63 11 22 02 2
C 00 80 63 11 22 03 4
D 00 80 63 11 22 04 4
E 00 80 63 11 22 05 4
F 00 80 63 11 22 06 3
G 00 80 63 11 22 07 3
H 00 80 63 11 22 08 2
I 00 80 63 11 22 09 2
J 00 80 63 11 22 10 2
Member of groups:
Name VlanID DU Bd Al
Group yellow 2
Allowed on MACH3000-ports
IP Address Slot Mod Port Ac Al
149.218.32.100 - 1 2
149.218.32.100 - 1 3
- Menu bar
- Toolbar
- Filecards
- View
Agent window
Toggle switch for intersecting and non-intersecting groups
Selection field for he items to be edited.
The remaining selection is shown on the right

Fig. 19: VLAN Manager main window

7.1.4 The network management station as a user

According to their basic settings, most new switches installed in a network are assigned to the VLAN with the ID 1.
In order that the network management station can always access new switches, we recommend assigning the network management station to the VLAN with the ID 1.

With HiVision's automatic VLAN ID assignment, the network management station is therefore always assigned to the VLAN with the ID 1. This means that all stations belonging to the same group as the network management station are also assigned to the VLAN with the ID 1.
For security reasons it is advisable to create a separate network management group.

7.2 Port-based VLANs

Port-based VLANs are characterized by the assignment of ports to a particular VLAN.
Ports can be assigned to any VLAN.
As such, devices at any place in the network can belong to a common VLAN when their ports are also assigned to the VLAN.

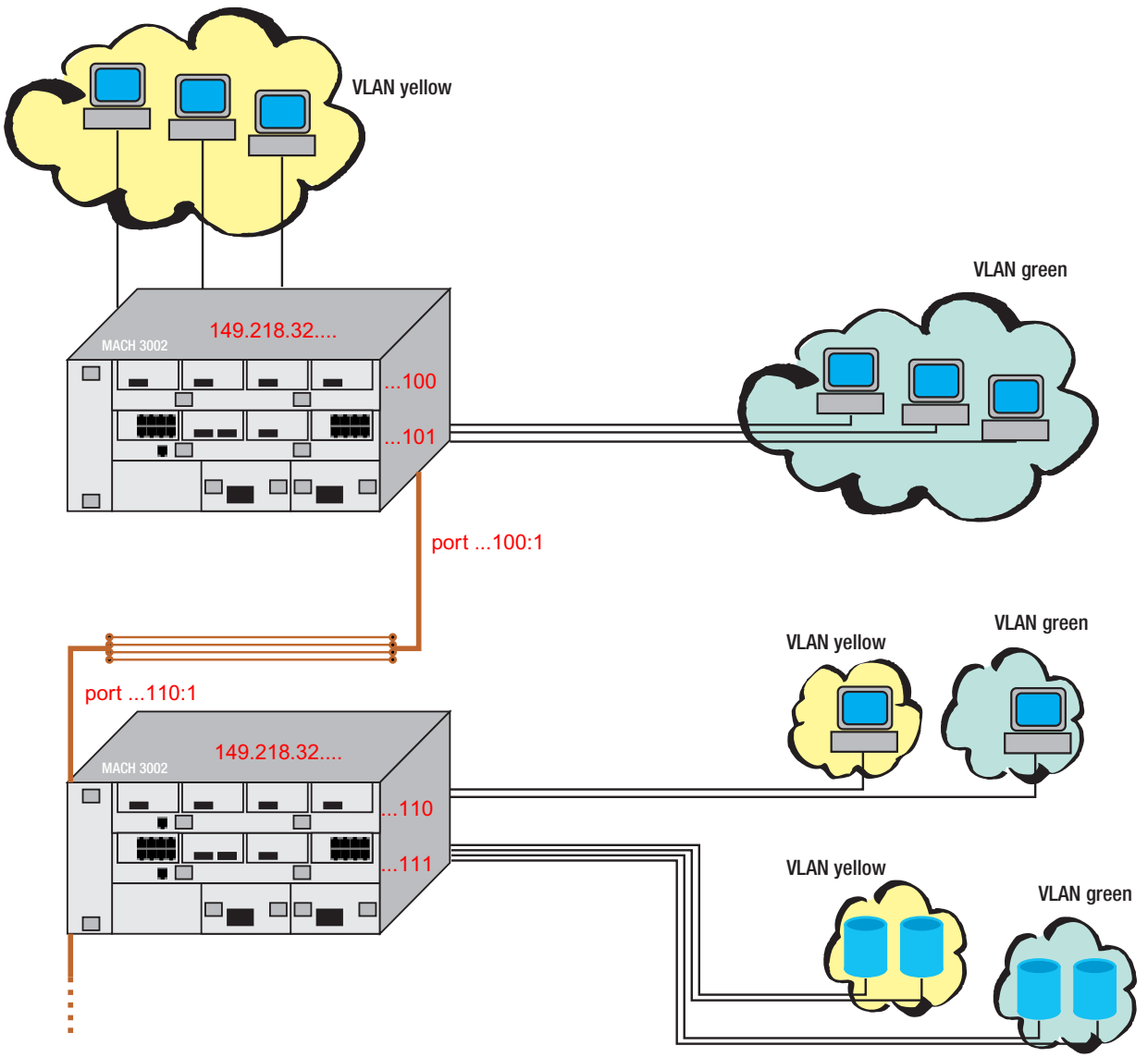

Fig. 20: Example of a port-based VLAN

7.2.1 Selecting the configuration type

☐ Select the configuration type as described in “Configuration types” on page 145. The toggle switch for intersecting or non-intersecting configurations is on the VLAN Manager filecard (see Fig. 19).

7.2.2 Selecting the agents

☐ Click on the `Agent list...` field in the bottom left corner of the VLAN Manager filecard.

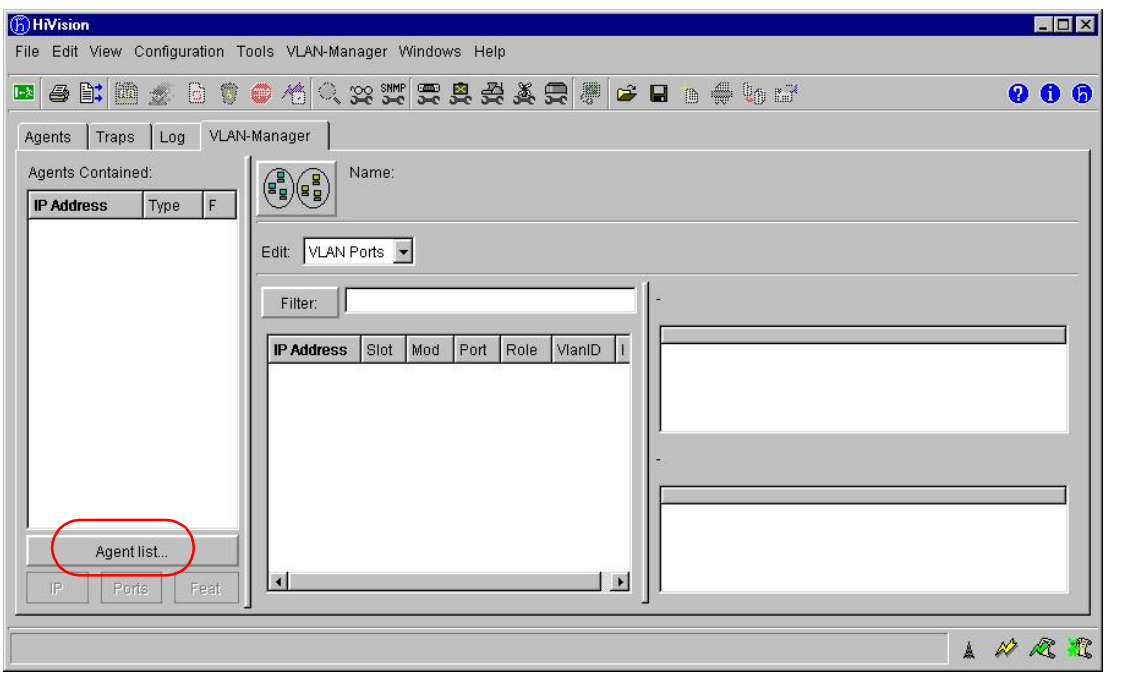

Fig. 21: Opening the agent selection window

☐ Highlight the agents you require in the right-hand column and click the left arrow button with the port icon to move them to the left-hand column.

Click `New` to enter the IP addresses of virtual agents. Under `Features` select the port-based setting and the agent type.

If you click the right arrow button, the highlighted line in the left-hand column is deleted.

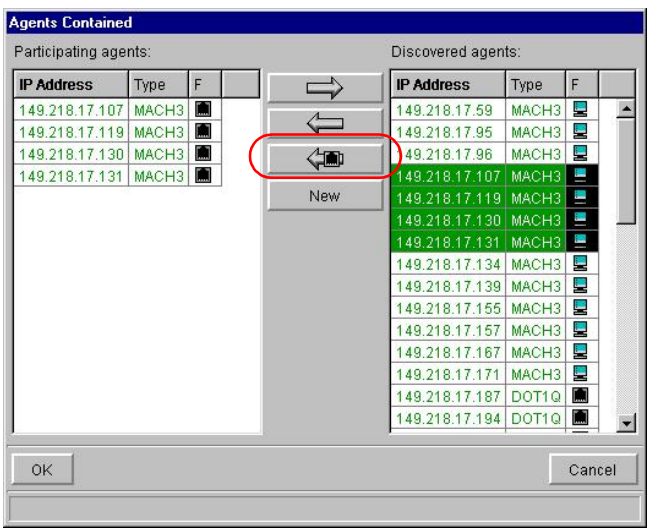

Fig. 22: Selecting the agents

☐ Click `OK` to transfer the agents to the list.
By selecting an agent and clicking a field under this table you can edit the
– IP address
– Selection of ports
– Port-based setting

HiVision shows the agents' ports in the middle of the VLAN Manager window.

Assign ports to virtually created agents by highlighting them and clicking the `Ports` field.

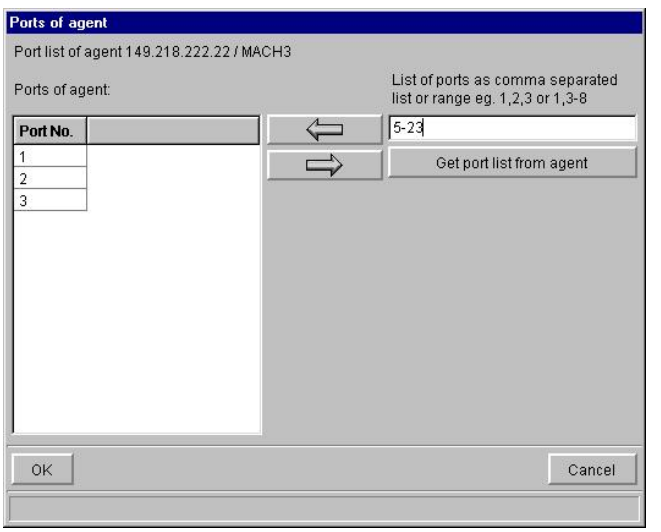

Fig. 23: Entering ports for virtual agents

Note: For the GES 24TP Plus always enter all available ports.

7.2.3 Creating groups

☐ Click on the `Edit` field on the VLAN Manager filecard and select `Groups`.

☐ Select `VLAN Manager:New...` from the menu bar.

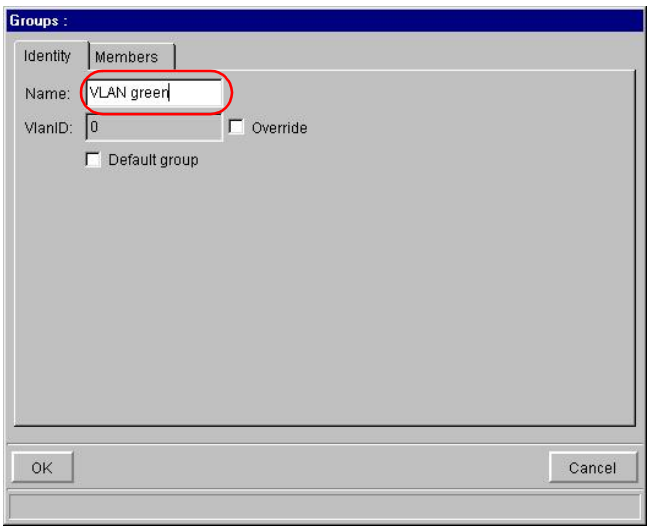

Fig. 24: Creating groups

☐ Enter the name of the group.

☐ If you want to enter the VLAN ID yourself, select `Override` and enter the VLAN ID.

☐ A cross in the `Default group` checkbox identifies the group to which all ports are assigned if they are not assigned to a group.

☐ On the `Members` filecard you can select the ports which will belong to the group.

☐ Select `Action: Add` and click `OK`. HiVision assigns the selected ports to the group (see Fig. 30).

7.2.4 Defining Uplink and port access

The connection between the switches is called the Uplink.

Uplink

- ☐ Click on the `Edit` field on the VLAN Manager filecard and select `VLAN ports`.
- ☐ Select the lines of the ports which are provided for linking different switches.
- ☐ Right-click in the `Role` field and select `Edit`.

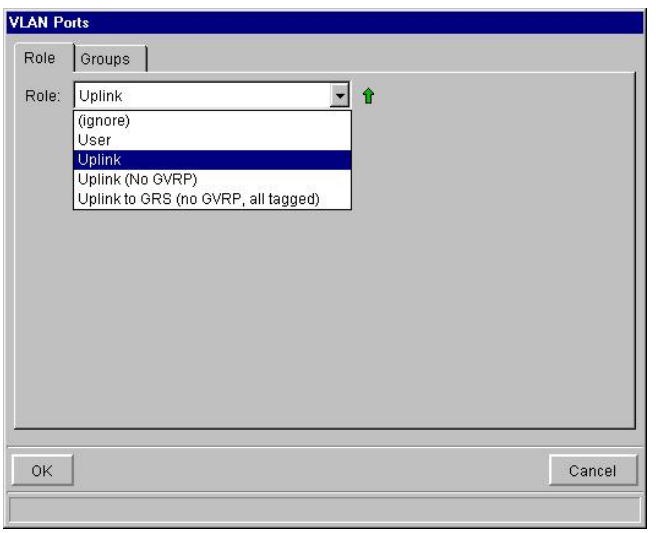

Fig. 25: Defining Uplink ports

- ☐ Select the type of connection you require and click `OK`.
  The VLAN Manager offers 3 optional Uplink settings:

  `Uplink`
  The port supports GVRP.
  The port transmits frames from VLAN 1 without tag and frames of other VLANs with tag.

  `Uplink (No GVRP)`
  The port transmits frames from VLAN 1 without tag and frames of other VLANs with tag.

`Uplink to GRS (no GVRP, all tagged)`
The port transmits all frames with tag.

`User`, `Group`, `Known`, `User`
Only non-tagged packets are transmitted.

With an existing configuration HiVision provides the option of looking for Uplinks. Enter a number for `Guess Uplinks`... and click `OK`.
HiVision sets the ports at which packets have been received with at least as many different MAC source addresses as the number you entered to `Uplink (no GVRP)`.
To make sure that all current MAC addresses are taken into account, first load them by selecting `Reload MAC tables`.... The antenna in the status bar continues flashing until the transmission is completed.

Network management station

☐ To identify your network management station, mark its port and click the right mouse button. Select `Mgmt stations`.... Note that HiVision assigns the VLAN with the ID 1 to the network management station's group. This means all ports in the same group are also assigned to the VLAN with the ID 1 (see “The network management station as a user” on page 149).

7.2.5 Saving the configuration to a file

☐ Save the data you entered in a file. HiVision stores this file in the `HiVision51/Data/var/vlans/` folder.
In the menu, select `VLAN Manager:Save:To file`....

7.2.6 Saving the configuration to the agents

Once all the settings have been defined virtually and then validated, the data can be transmitted to the agents.

Note: Do not transmit the settings to the agents before you have made sure that your network management station still has access with these settings. The network management station needs access to the port to which you are connected, so that you can continue making configurations in the network.

☐ In the menu, select `VLAN Manager:Save:To agents`.... The wizard guides you through the necessary steps.
First, it performs a consistency test and shows you the result.
When you click `Next` the wizard gives you the opportunity to change particular settings.
Click `Next` again, and you can select the agents on which to store the configuration.
When you click `Finish` the wizard transfers the data to the selected agents. The duration of the transmission depends upon the devices (with GES and SNMP configuration in HiVision, set the timeout to >5s and 2 retries).

Error messages and information from the consistency test
The name of the configuration is too long (maximum 39 characters)
There are no management ports/stations
Agent running in MAC-based VLAN mode
Device has fewer ports than defined in the configuration
Unknown agent type, the configuration must be saved on the device manually
Agent has no Uplinks
This agent is not responding
This agent is currently being queried, the port list may be incomplete
This configuration cannot be reloaded by the agents

Table 12: Consistency test

Note: With MACH 3000 and GRS HiVision switches off the Spanning Tree algorithm at all ports except Uplink ports.

Note: If you expressly wish to have the Spanning Tree algorithm at an Uplink port, then check this setting.

7.3 MAC-based VLANs

Since MAC-based VLANs compile stations to groups, MAC-based VLANs are also referred to as user groups.

MAC-based VLANs are much more flexible than standard port-based VLANs.

- Flexibility
  With MAC-based VLANs stations can be moved without reconfiguring the switches. Since the VLAN assignment is defined using the station's MAC address, it always belongs to the same group. It does not matter which port the station is connected to.

- Security
  Each station is bound to its group.
  If a station changes to another port, it always retains its membership of the group. This is not always the case with port-based VLANs.

  Access rights can be set at each port.
  If an access violation occurs at a port, the agent can react differently according to the setting. Possible reactions include:
  – Denying access
  – Ignoring the violation
  and/or
  – Sending a trap.

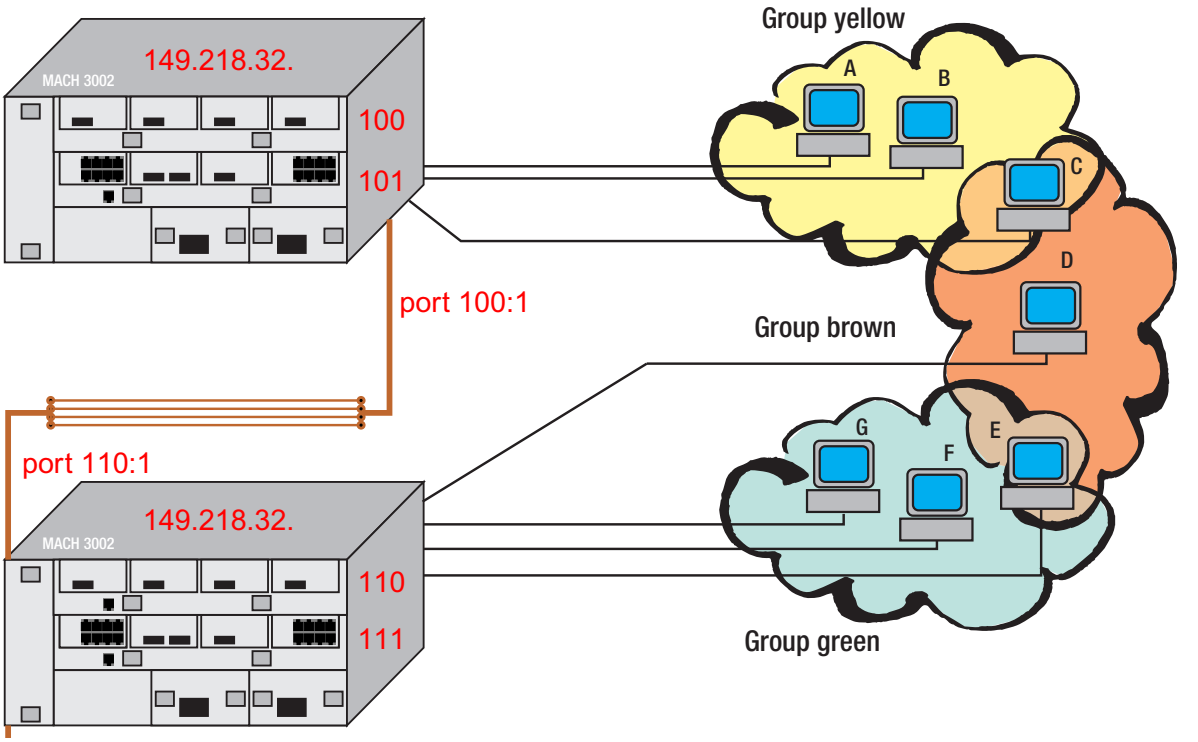

Fig. 26: Example of a MAC-based VLAN

7.3.1 Selecting the configuration type

☐ Select the configuration type as described in “Configuration types” on page 145. The toggle switch for intersecting or non-intersecting configurations is on the VLAN Manager filecard (see Fig. 19).

7.3.2 Selecting the agents

☐ Click on the `Agent list...` field in the bottom left corner of the VLAN Manager filecard.

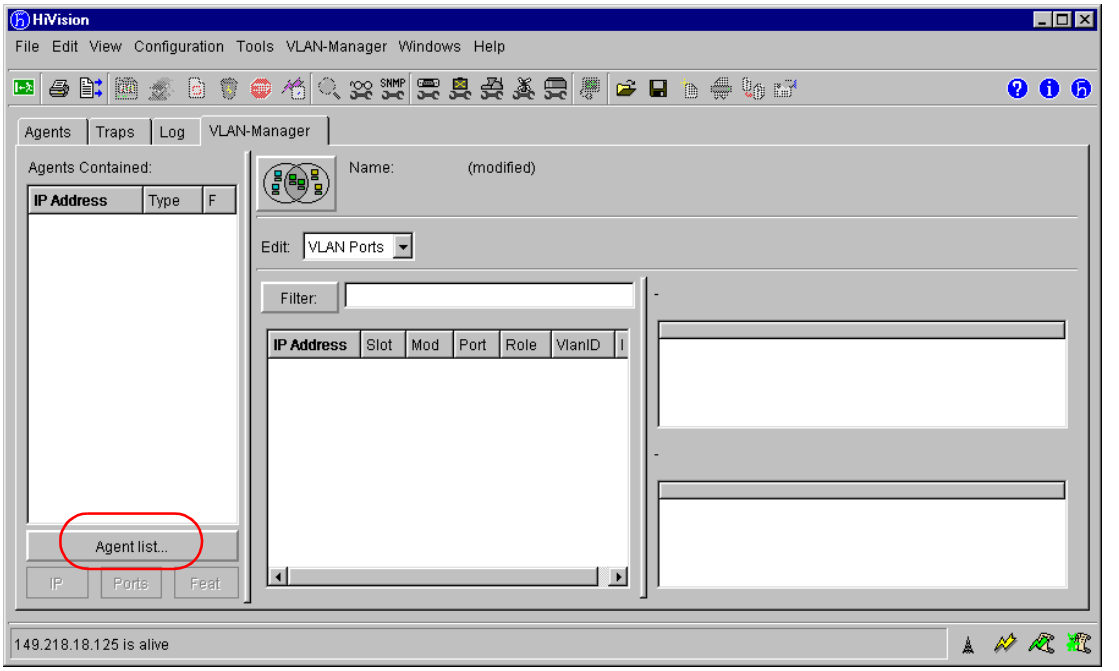

Fig. 27: Opening the agent selection window

☐ Highlight the MACH 3000s you require in the right-hand column and click the left arrow button without the port icon to move them to the left-hand column.

Click `New` to enter the IP addresses of virtual agents. Under `Features` select the MAC-based setting and the agent type.

If you click the right arrow button, the highlighted line in the left-hand column is deleted.

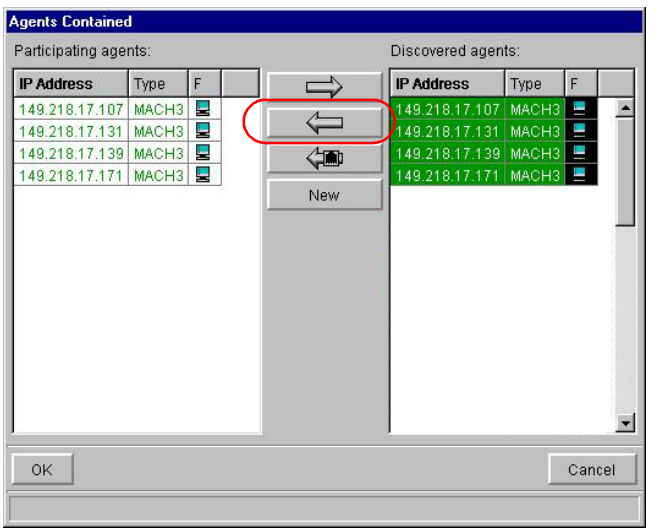

Fig. 28: Selecting the agents

Click `OK` to transfer the agents to the list.
By selecting an agent and clicking a field under this table you can edit the

- IP address
- Selection of ports
- Port-based setting

7.3.3 Creating stations

☐ In the main window on the VLAN-Manager tab, select `Edit Stations`.

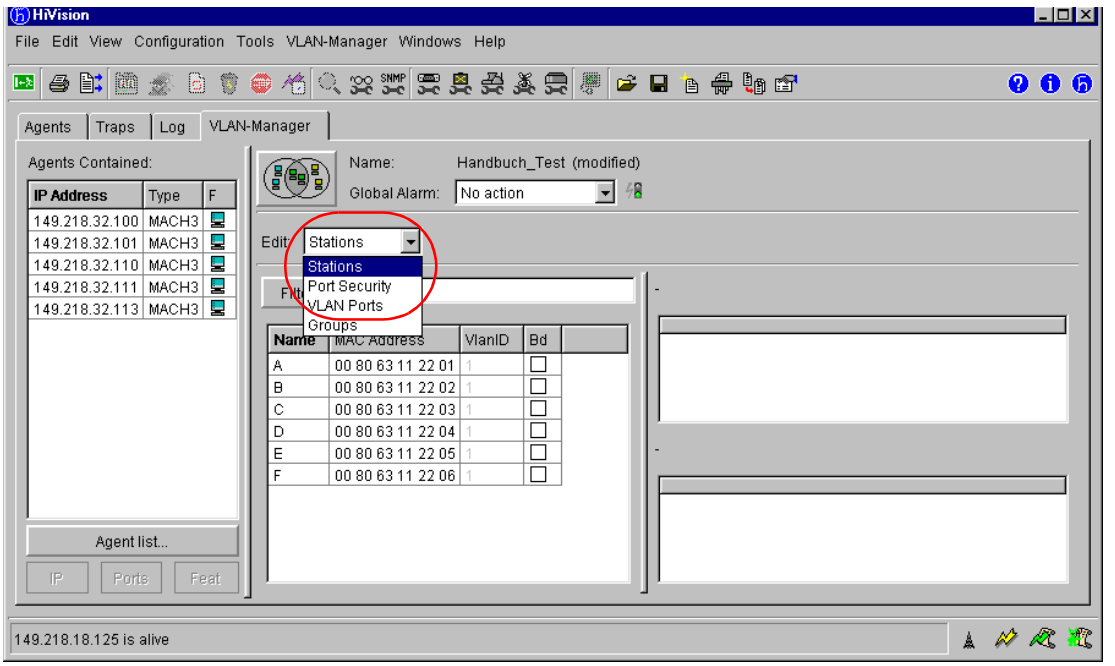

Fig. 29: Selecting stations

☐ Select `VLAN Manager:New...` from the menu bar.

☐ Create the stations.
– For the identity, enter the MAC address and the station name. HiVision writes the name with the MAC address in the HiVision directory to the file `data/var/ethers`.

☐ Under `Security` specify whether the station can be connected to any port – select `Unbound` – or certain ports only – select `Bound`.
This setting is important for devices which – for security reasons – may not be simulated at another port without authorization and using a fake MAC address.
Stations which are often used in different places should be given the setting `Unbound`.

If you have already defined the groups and port access rights, then you can still assign the group membership and port access rights in this window. On initial configuration it is easier to perform these settings later.

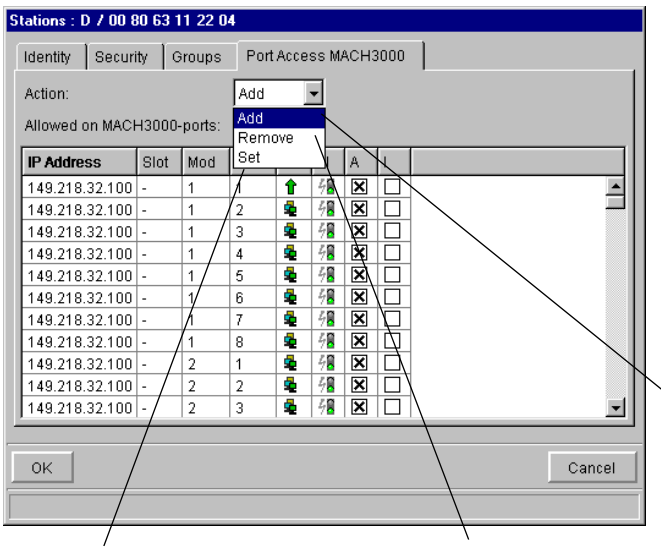

Fig. 30: Station configuration

☐ To identify your network management station, mark it and click the right mouse button. Select `Mgmt stations`... Note that HiVision assigns the VLAN with the ID 1 to the network management station's group. This means all devices in the same group are also assigned to the VLAN with the ID 1 (see “The network management station as a user” on page 149).

7.3.4 Creating groups

☐ In the main window on the VLAN-Manager tab, select `Edit Groups`.

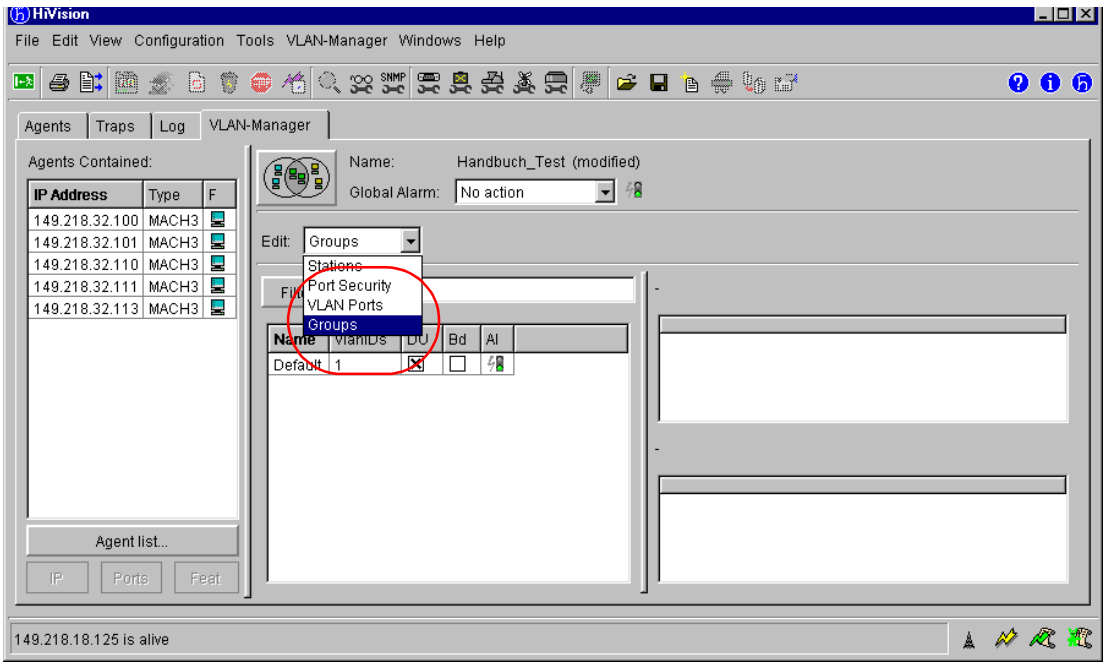

Fig. 31: Selecting groups

☐ Select `VLAN Manager:New...` from the menu bar.

☐ Enter the name of the group.

☐ A cross in the `Default group` checkbox identifies the group to which all stations are assigned if they are not assigned to a group.

☐ On the `Members` filecard you can select the stations which will belong to the group.

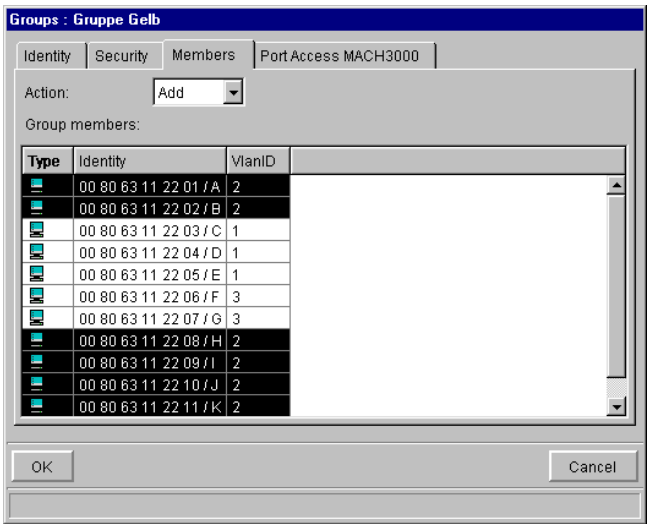

Fig. 32: Group membership

☐ Under `Security` specify whether the stations in the group can be connected to any port – select `Unbound` – or certain ports only – select `Bound`.
This setting is important for devices which, for security reasons, may not be replicated without authorization.
Groups whose stations are often used in different places should be given the setting `Unbound`.

☐ Under `Security` specify how the agent reacts in the event of an access violation.

7.3.5 Defining Uplink and port access

The connection between two switches is called the Uplink.

Uplink

☐ Click on the `Edit` field on the VLAN Manager filecard and select `Port security`.

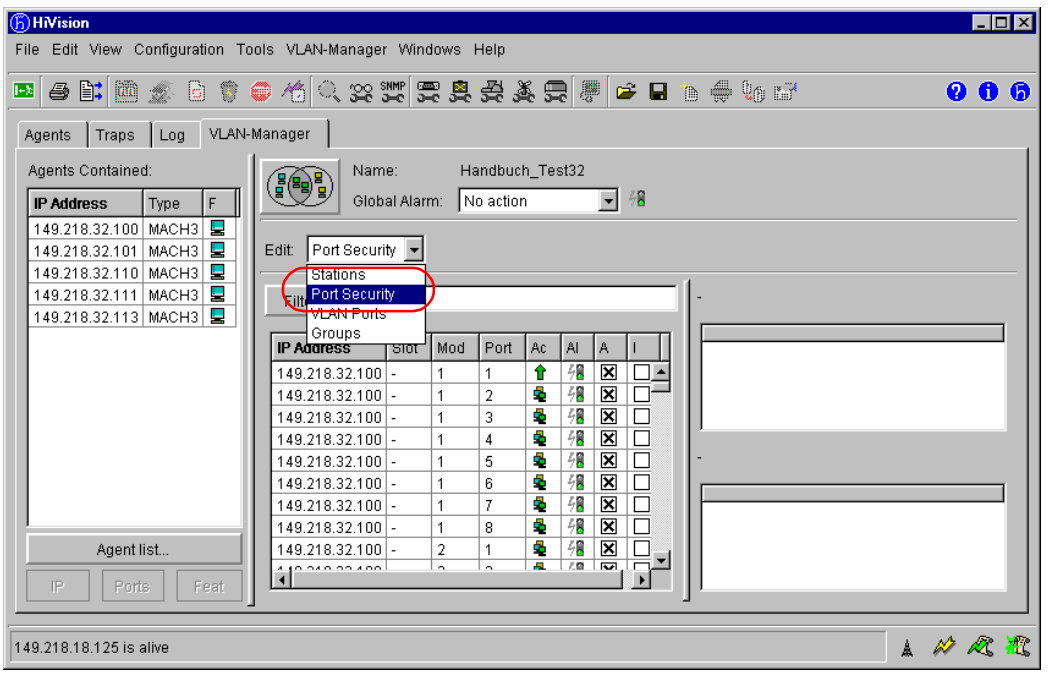

Fig. 33: Selecting port access

☐ Select the lines for the ports with the same connection type.
☐ Right-click in the `AC` field and select `Edit`.

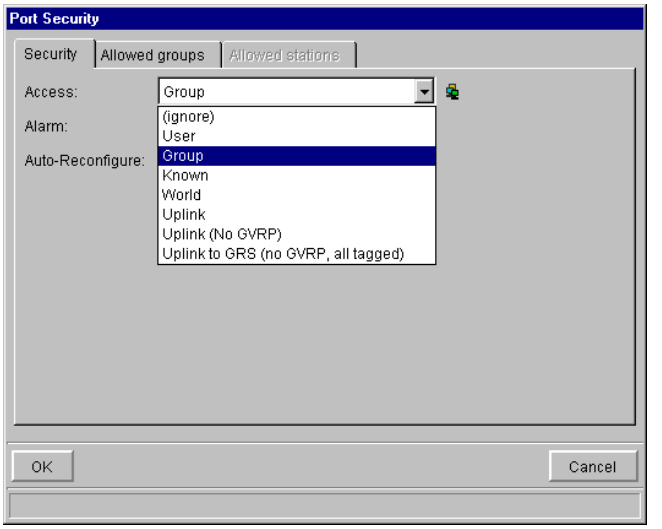

Fig. 34: Defining port access

☐ Select the type of connection you require and click `OK`.
The VLAN Manager offers 7 optional connection settings:

`Uplink`
The port supports GVRP.
The port transmits frames from VLAN 1 without tag and frames of other VLANs with tag.

`Uplink (No GVRP)`
The port transmits frames from VLAN 1 without tag and frames of other VLANs with tag.

`Uplink to GRS (no GVRP, all tagged)`
The port transmits all frames with tag

`User`
Only non-tagged packets are transmitted. The port only accepts those stations selected under `Allowed stations`.

`Group`
Only non-tagged packets are transmitted. The port only accepts the group selected under `Allowed groups`.

`Known`
Only non-tagged packets are transmitted. The port only accepts those stations entered in the switch's forwarding list.

`World`
Only non-tagged packets are transmitted. The port allows access for all stations.

With an existing configuration HiVision provides the option of looking for Uplinks. Enter a number for `Guess Uplinks…` and click `OK`.
HiVision shows you the ports at which packets have been received with at least as many different MAC source addresses as the number you entered.
To make sure that all current MAC addresses are taken into account, first load them by selecting `Reload MAC tables…`. The antenna in the status bar continues flashing until the transmission is completed.

Network management station

☐ To identify your network management station, mark its line and click the right mouse button. Select `Mgmt stations…`. Note that HiVision assigns the VLAN with the ID 1 to the network management station's group. This means all stations in the same group are also assigned to the VLAN with the ID 1 (see “The network management station as a user” on page 149).

7.3.6 Saving the configuration in a file

☐ Save the data you entered in a file. HiVision stores this file in the `HiVision51/Data/var/vlans/` folder.
In the menu, select `VLAN Manager:Save:To file…`.

7.3.7 Testing the configuration

- ☐ Select `VLAN-Manager:Analyse` to test whether your network management station can access the port to which it is connected (see Fig. 35). When you double-click in the network management station line, HiVision displays the port access rights in the lower section of the window.
- ☐ Also test the port access rights of the other stations.

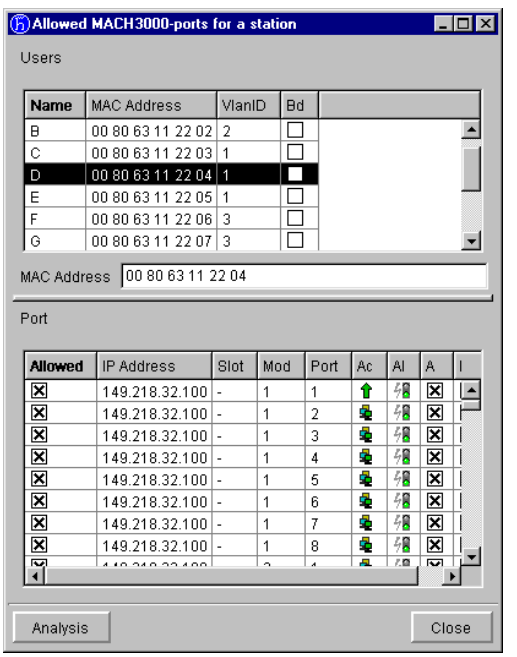

Fig. 35: Analysis

7.3.8 Saving the configuration to the agents

Once all the settings have been defined virtually and then validated, the data can be transmitted to the agents.

Note: Do not transmit the settings to the agents before you have made sure that your network management station still has access with these settings. The network management station needs access to the port to which you are connected, so that you can continue making configurations in the network.

☐ In the menu, select `VLAN Manager:Save:To agents`.... The wizard guides you through the necessary steps.
First, it performs a consistency test and shows you the result.
When you click `Next` the wizard gives you the opportunity to change particular settings.
Click `Next` again, and you can select the agents on which to store the configuration.
When you click `Finish` the wizard transfers the data to the selected agents.

Error messages and information from the consistency test
The name of the configuration is too long (maximum 39 characters)
There are no management ports/stations
Agent running in MAC-based VLAN mode
Device has fewer ports than defined in the configuration
Unknown agent type, the configuration must be saved on the device manually
Agent has no Uplinks
This agent is not responding
This agent is currently being queried, the port list may be incomplete
This configuration cannot be reloaded by the agents

Table 13: Consistency test

Note: With MACH 3000 HiVision switches off the Spanning Tree algorithm at all ports except Uplink ports.

Note: If you expressly wish to have the Spanning Tree algorithm at an Uplink port, then check this setting.

The network management station sends the same user and group information to each agent.
Each agent receives the port security data which is relevant to it.

Transmission status:

Yellow - active

Red - transmission error

Green - transmission completed

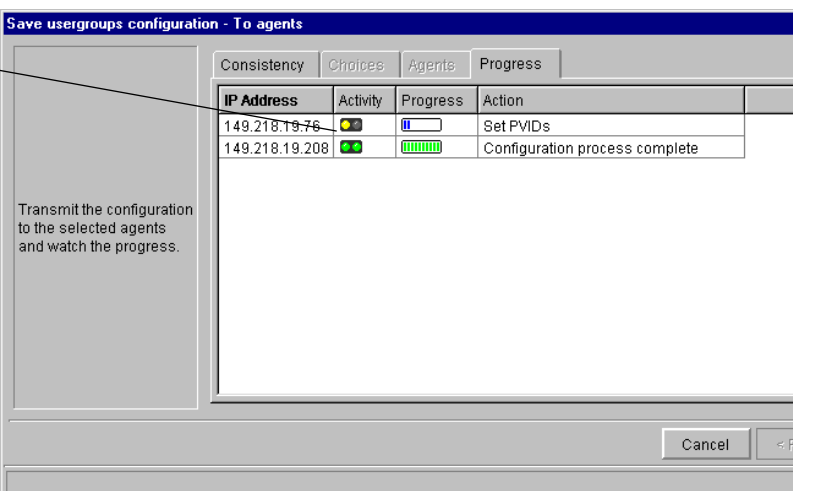

Fig. 36: Transmitting settings to agents

Once the transmission has been completed, the transmission status indicator flashes and the window is closed. After the transmission has been completed this user group management configuration is active.

7.4 VLAN configuration example

The following example provides a quick introduction to configuring a VLAN network which is often used in practice.
The configuration is performed step-by-step using the “Example of a port-based VLAN” on page 151 with the aid of the VLAN Manager.
The previous sections in this chapter contain more detailed information.

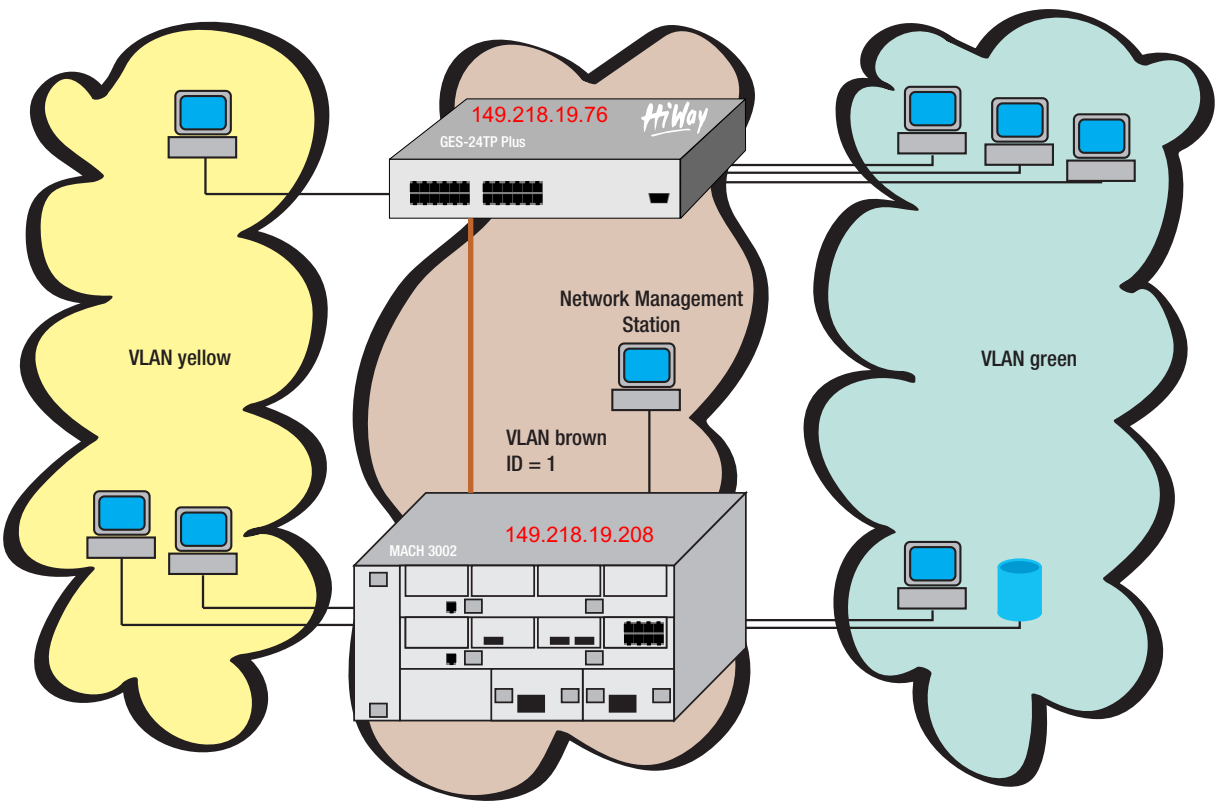

Fig. 37: Example of a port-based VLAN

7.4.1 Selecting the configuration type

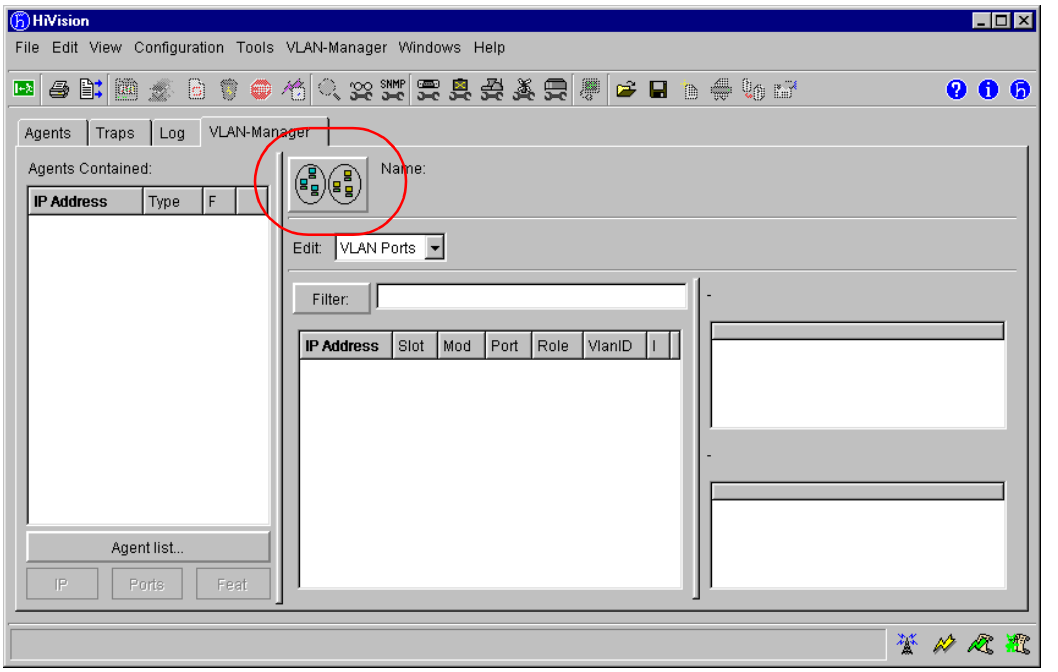

Fig. 38: Selecting a non-intersecting configuration

7.4.2 Selecting the agents

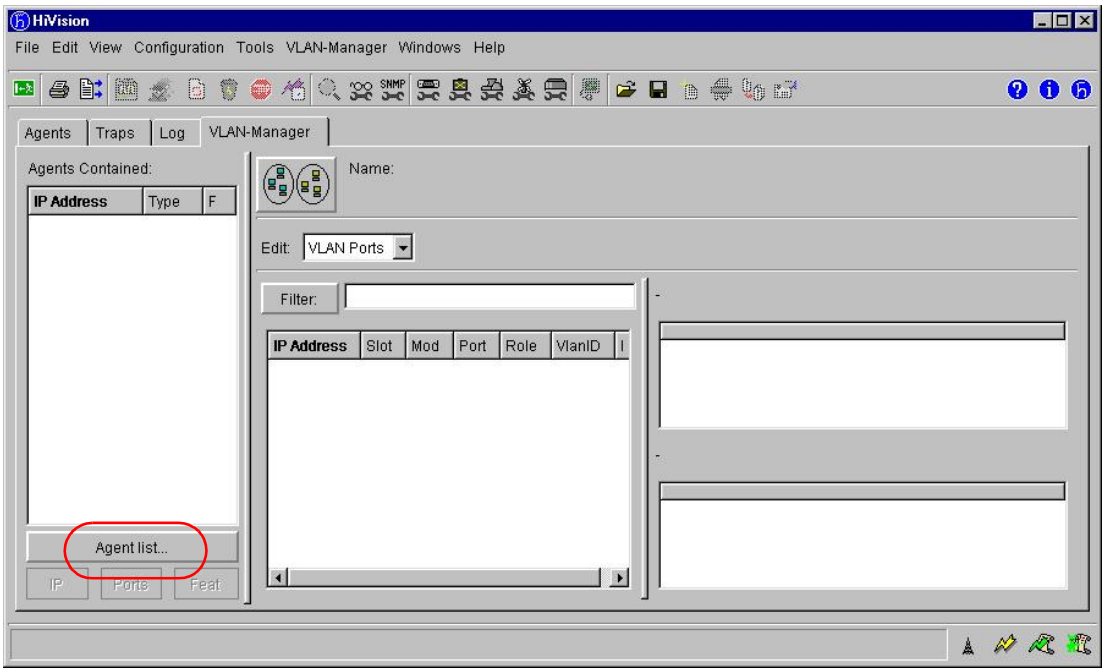

Fig. 39: Opening the agent selection window

☐ Highlight the agents you require in the right-hand column and click the left arrow button with the port icon to move them to the left-hand column.

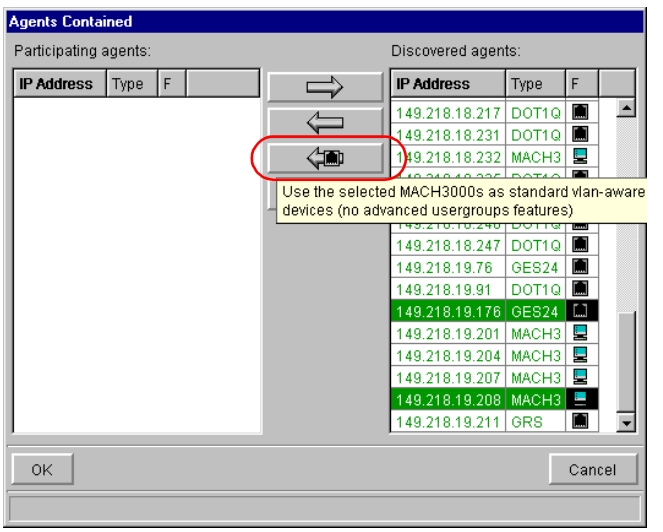

Fig. 40: Selecting the agents

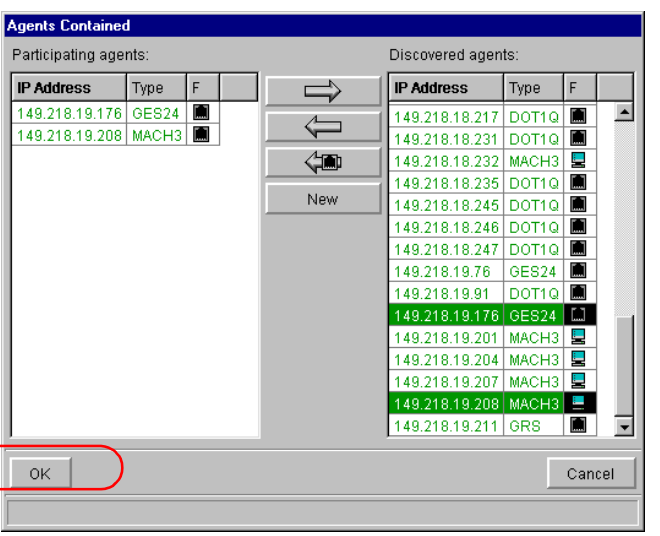

Fig. 41: Adding the agents

Creating groups

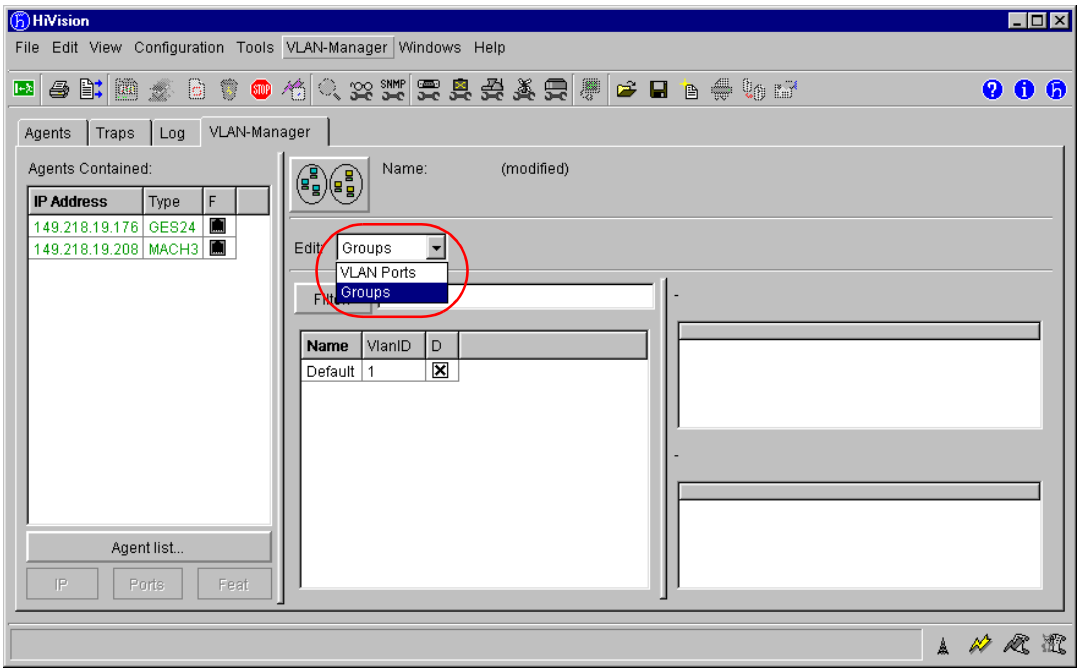

Fig. 42: Selecting groups

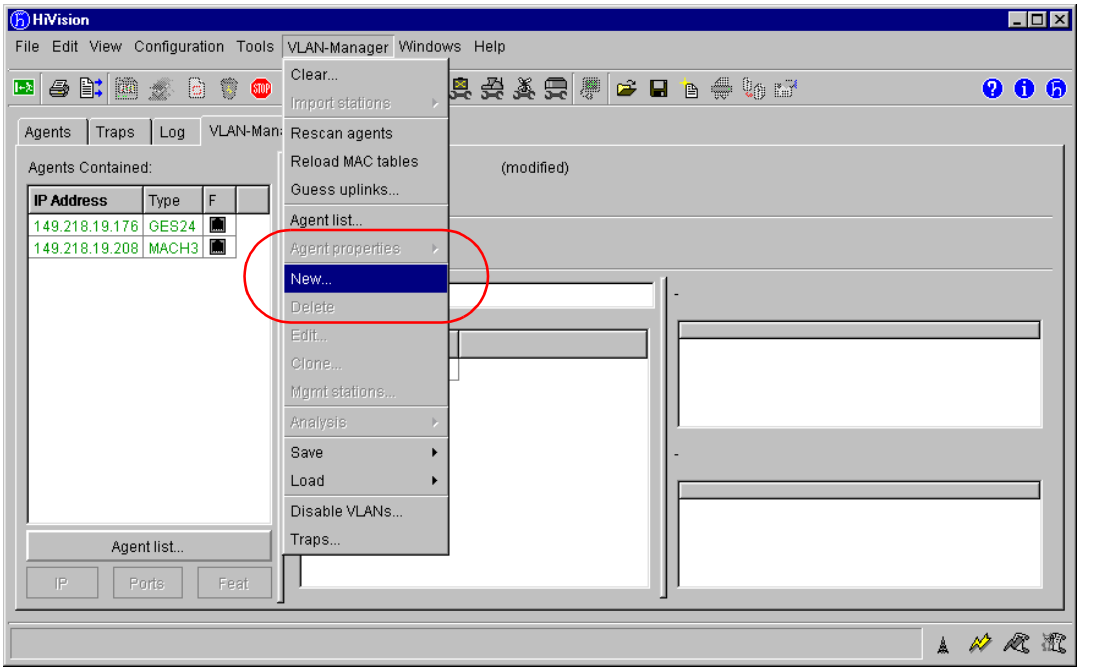

Fig. 43: New group

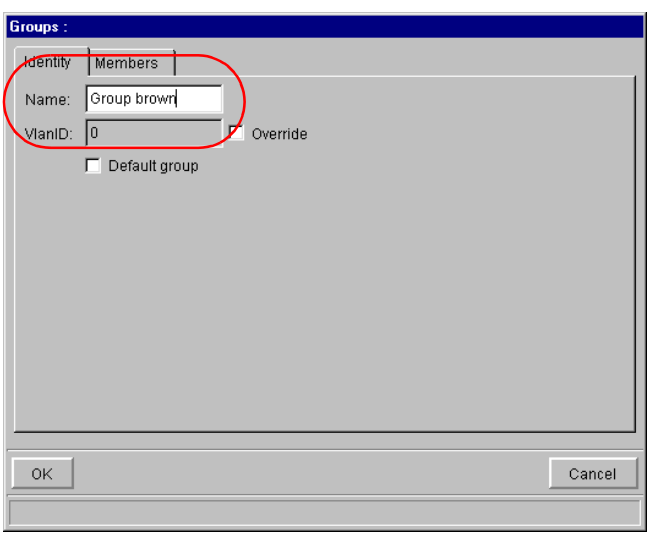

Fig. 44: Entering the name of the group – "brown"

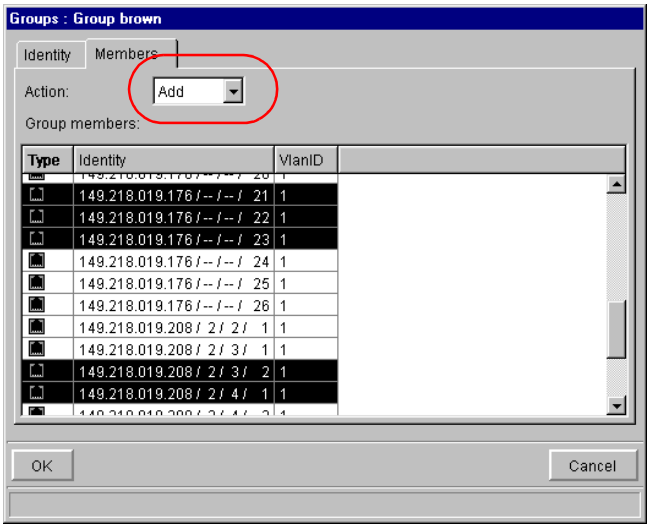

Fig. 45: Assigning ports to the group

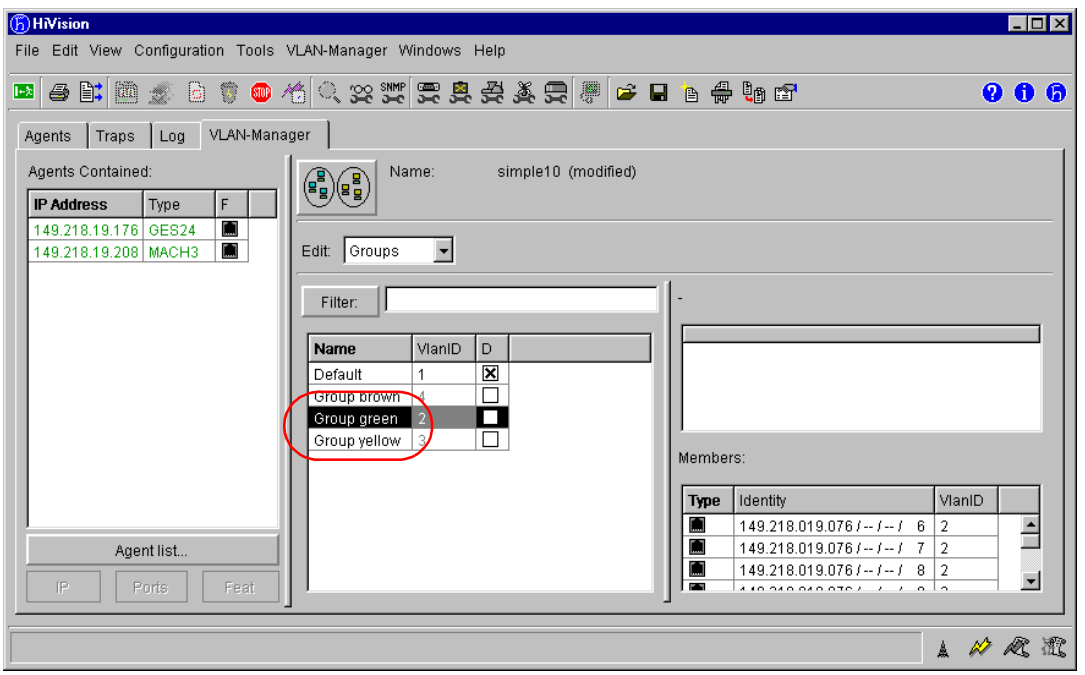

Fig. 46: Creating the yellow and green groups in the same way as the brown group

7.4.3 Defining Uplink and port access

The connection between the switches is called the Uplink.

Uplink

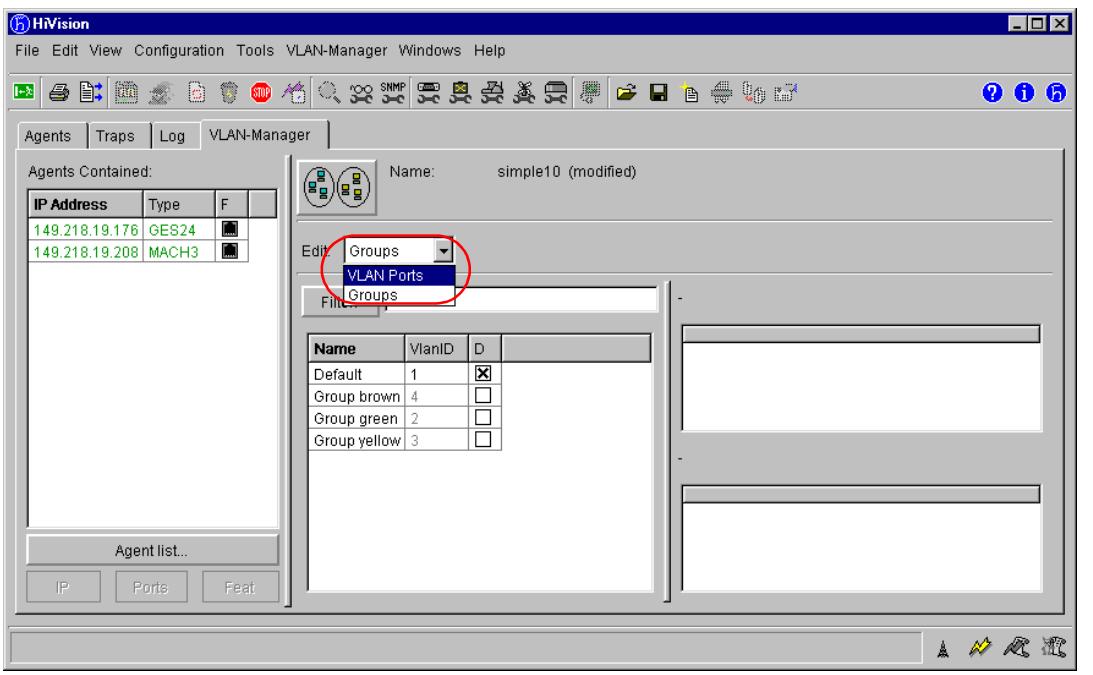

Fig. 47: Selecting VLAN ports for the Uplink definition

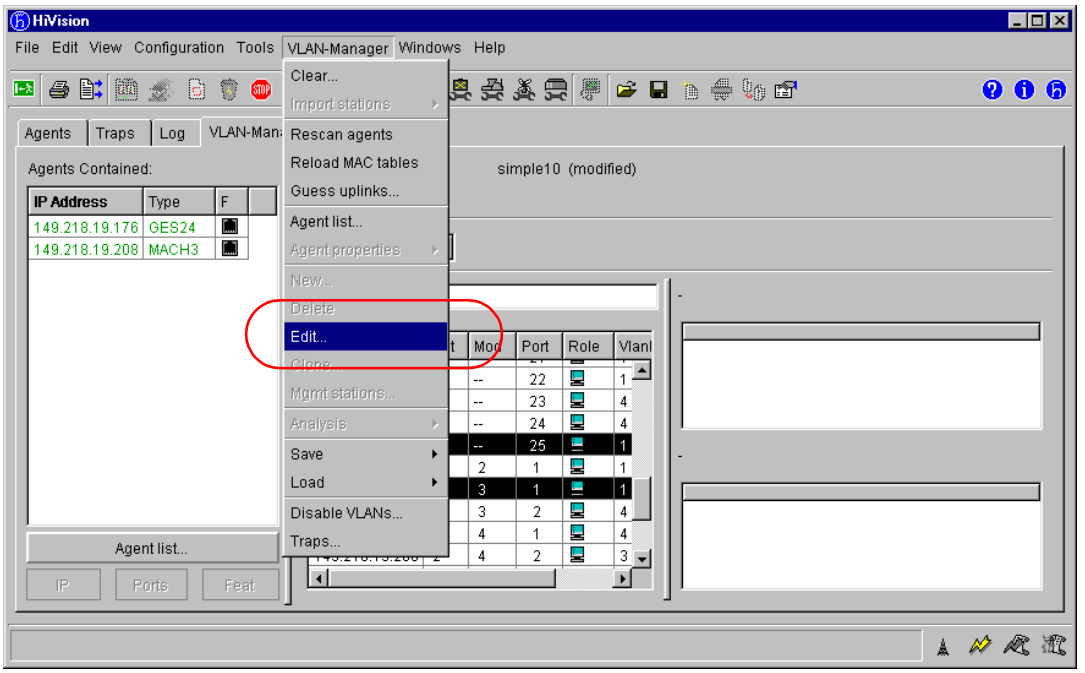

Fig. 48: Highlighting Uplink ports and selecting "Edit"

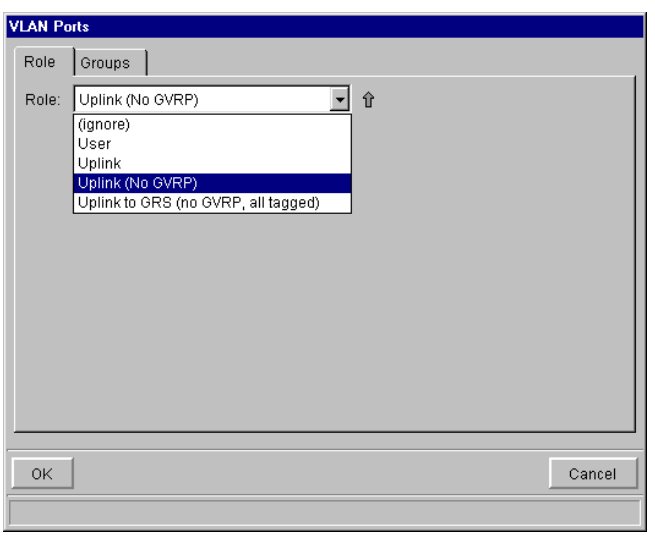

Fig. 49: Selecting the connection type

Network management station

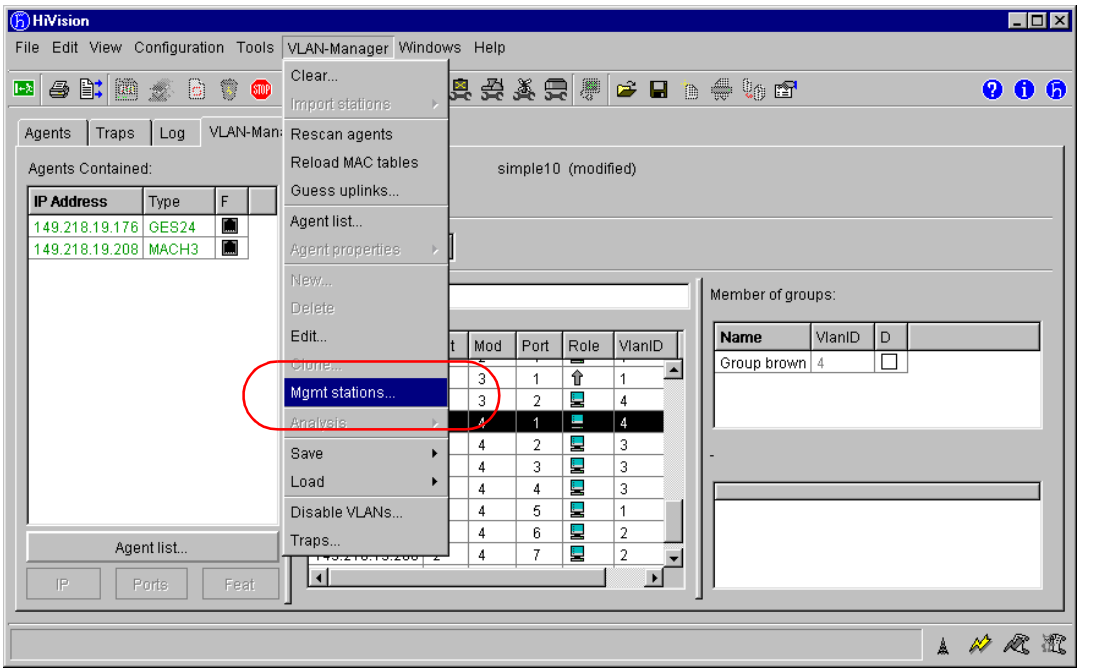

Fig. 50: Highlighting the management connection port and selecting "Mgnt stations"

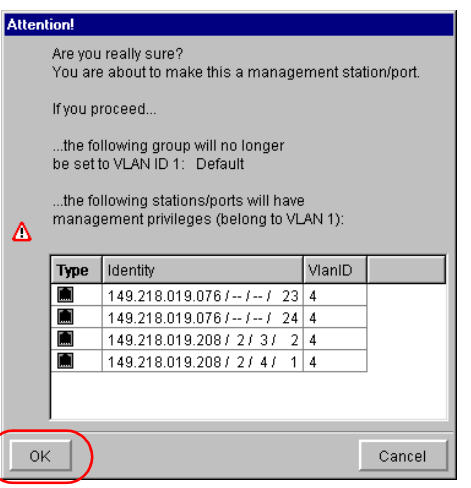
Attention!
Are you really sure?
You are about to make this a management station/port.
If you proceed...
...the following group will no longer
be set to VLAN ID 1: Default
...the following stations/ports will have
management privileges (belong to VLAN 1):
Type Identity VlanID
149.218.019.076 / -- / -- / 23 4
149.218.019.076 / -- / -- / 24 4
149.218.019.208 / 2 / 3 / 2 4
149.218.019.208 / 2 / 4 / 1 4
OK
Cancel

Fig. 51: Specifying the management connection port

7.4.4 Saving the configuration to a file

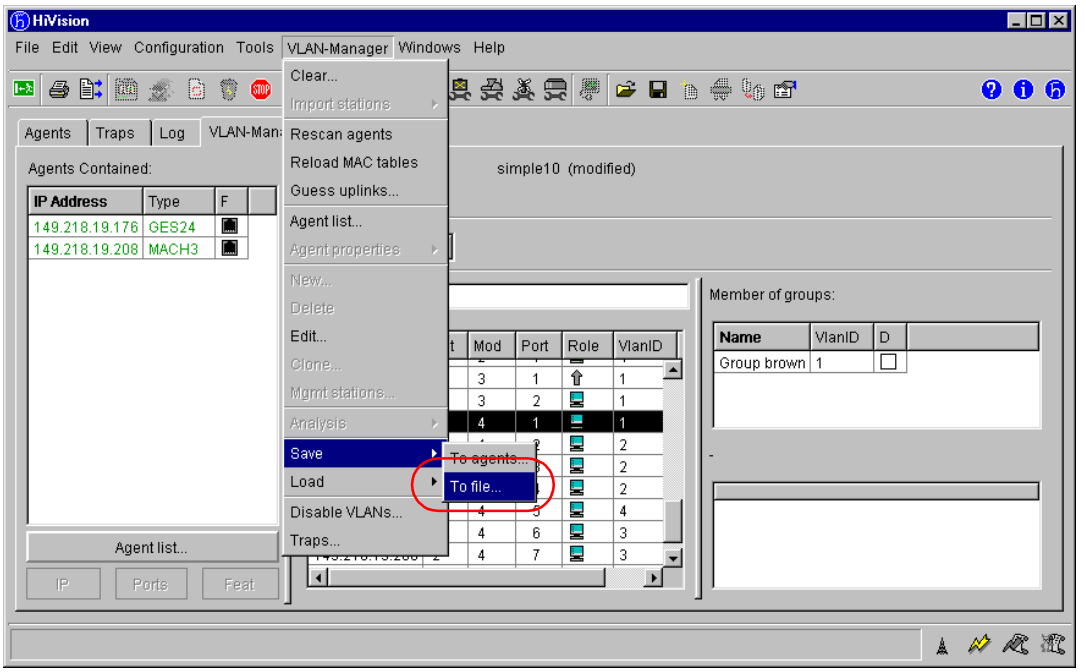

Fig. 52: Selecting Save to file

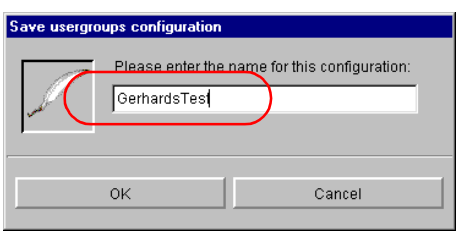

Fig. 53: Entering the file name

7.4.5 Saving the configuration to the agents

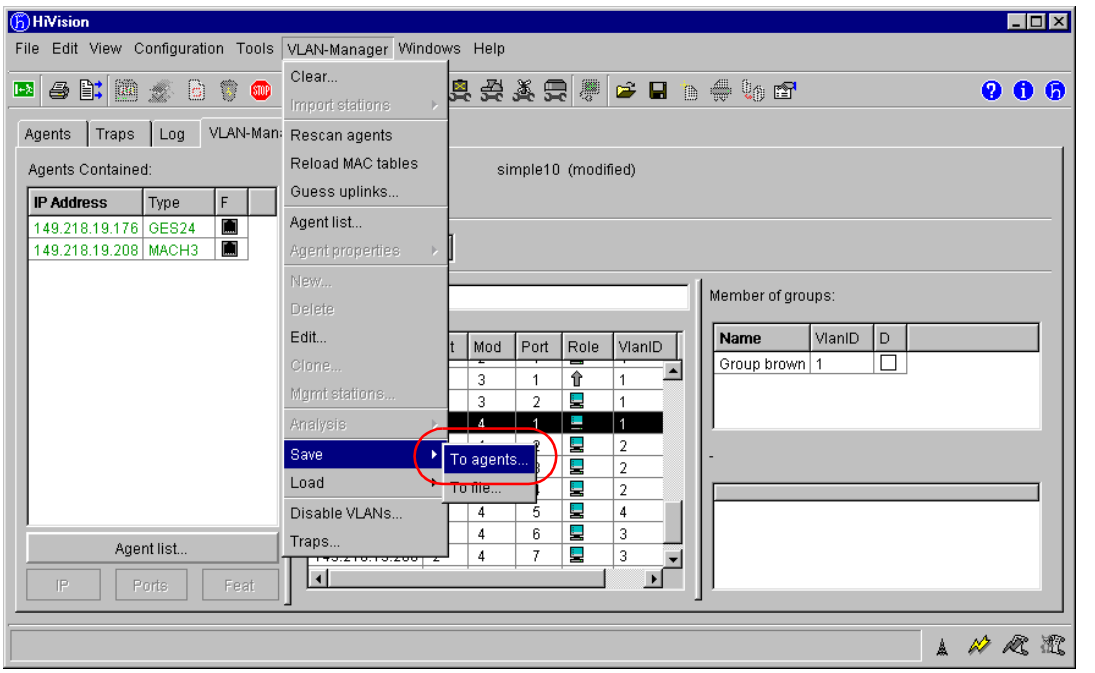

Fig. 54: Selecting Save to agents

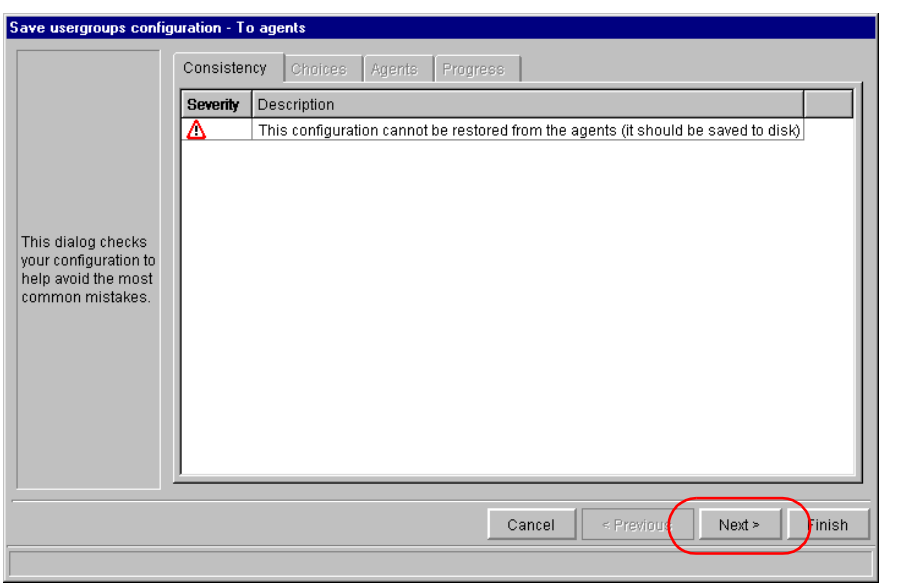

Fig. 55: Consistency test result

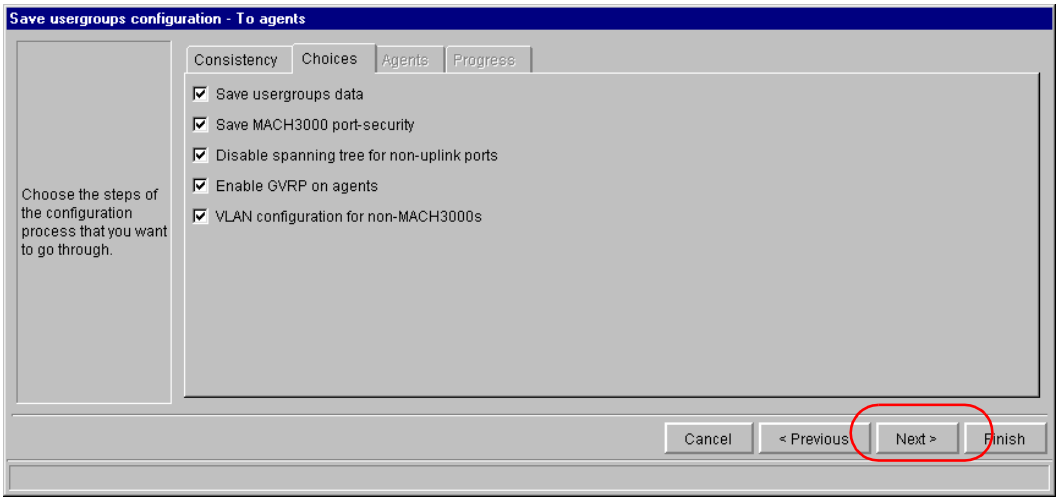

Fig. 56: Selecting configuration steps

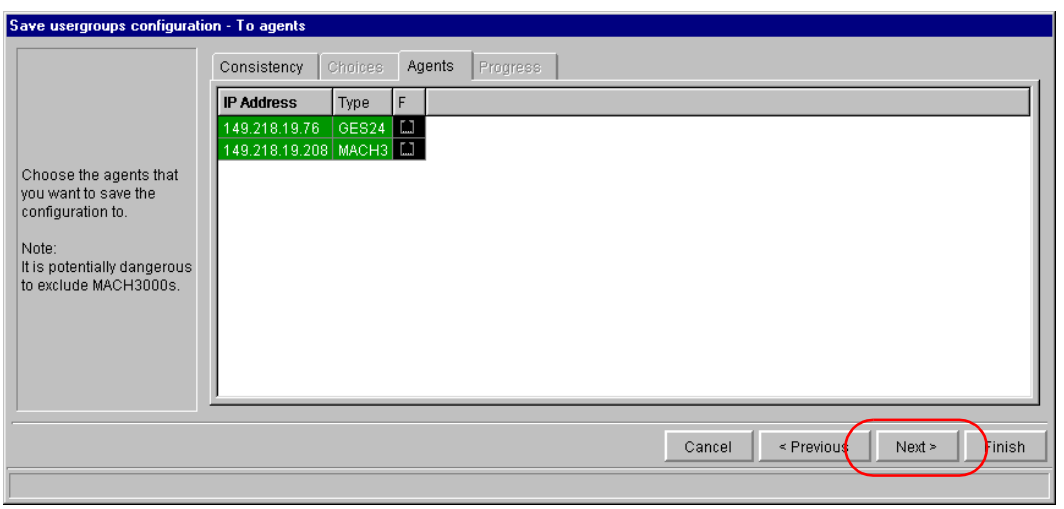

Fig. 57: Selecting agents to be configured

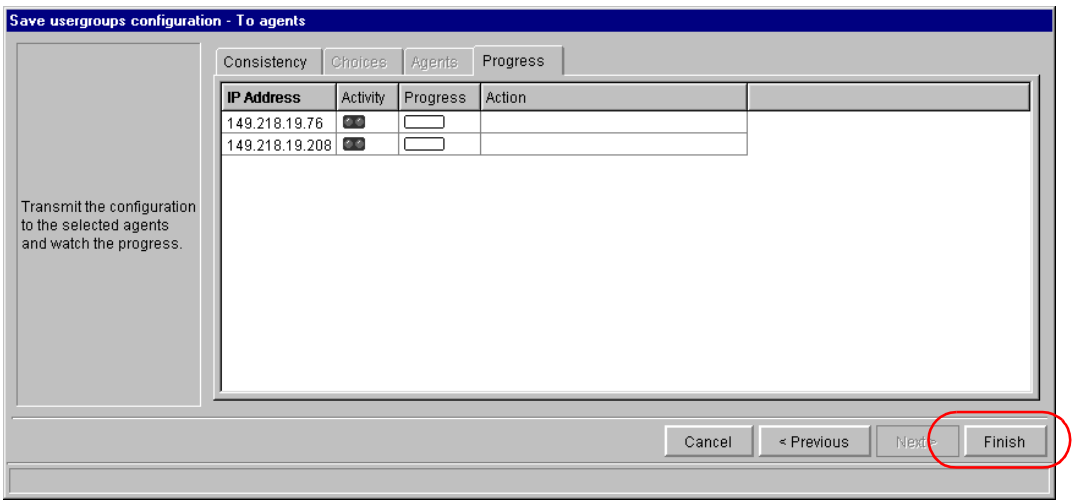

Fig. 58: Starting the transmission of the configuration by clicking "Finish"

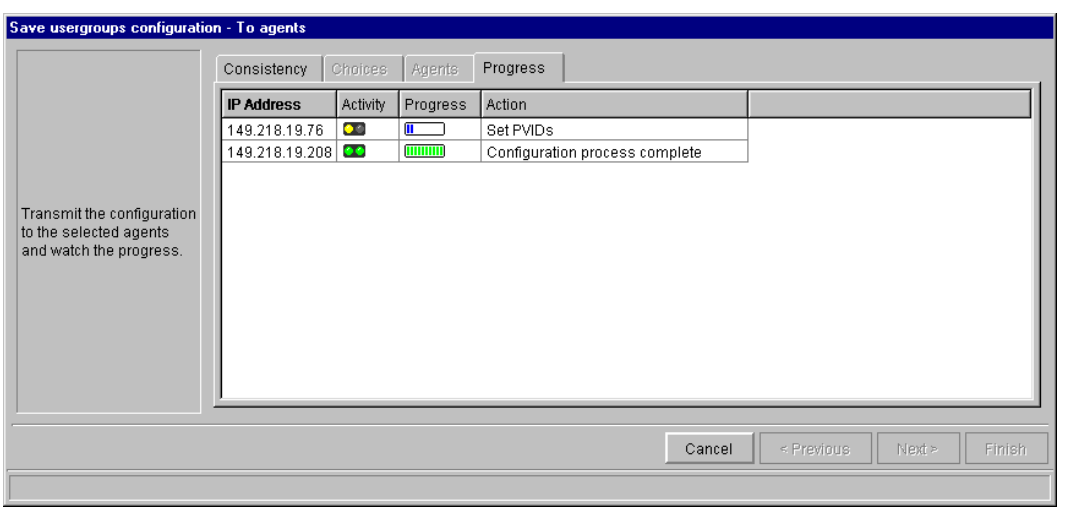

Fig. 59: Transmission status display

7.4.6 Examples for configuration files

In the HiVision directory under `data/var/vlans/` you find configuration files with further VLAN examples.

In the HiVision directory under `data/kernel/doc/vlans/` you find the description of the VLAN examples.

8 Creating a PSM

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Hirschmann supplies the modules Enterprise and Industrial Line with HiVision. With these two modules, HiVision can all administrate all Hirschmann agents. With the help of **P**roduct**-S**pecific **M**odules (PSM), users can themselves integrate third-party devices with HiVision and manage them via HiVision.

This chapter explains how to create a PSM using the BinTec X1000 routers as an example.

To create a PSM you will need the following:

- An image processing program, for example, Microsoft Photo Editor.
- A drawing program, for example,
  Microsoft Paint (Windows) for bmp files
  dticon (HP-UX) for xpm files
  pixmap oder Kiconedit (Linux) for xpm files.
- A text editor, for example, Accesories:WordPad,
  possibly an XML editor.

8.1 Preparation

8.1.1 Program functions

Before you start creating PSMs, you should be familiar with the functions of the program you wish to describe with PSM.
Analyze the function units according to the criterion of how they can be integrated into HiVision.

- **Displaying the agents in the main window**
  HiVision provides the following fields for display in the main window:
  – `Type`: Icon of the product family to which the product belongs.
  – `Type`: Name of the product.
  – `System Location`: Where the product is installed.
  – `System name`: A significant name that you assign the product.
  – `Special information`: any information that you would like to list here.
  – `Software version`, in as far as the product provides a MIB variable.

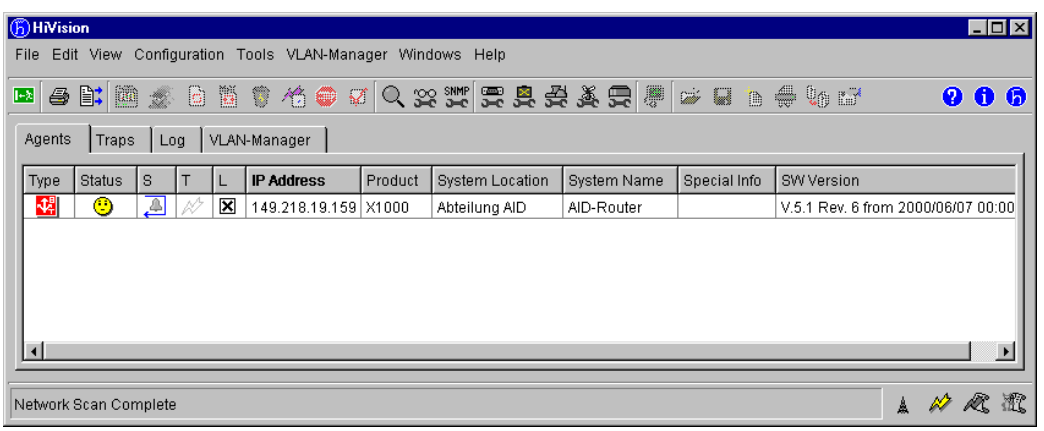
HiVision
File Edit View Configuration Tools VLAN-Manager Windows Help
Agents Traps Log VLAN-Manager
Type Status S T L IP Address Product System Location System Name Special Info SW Version
149.218.19.159 X1000 Abteilung AID AID-Router V.5.1 Rev. 6 from 2000/06/07 00:00
Network Scan Complete

Fig. 60: PSM display in the main window

Displaying the agent in the Device window

HiVision offers various cards and displays the device functions for displaying the Device window.

– "Image" card with device functions
The "Image" card offers the option of displaying an image file in the JPEG format.
Symbols are located above the status line in the Device window for representing device-specific functions. HiVision automatically places the agent and housing symbol in this line. You can freely define the other symbols (parts).

– "Device Description" card
The card "Device Description" card models part of the system MIB.

– "Physical map" card
The "Physical Map" card displays the physical interfaces of the product.

– "Logical map" card
The "Logical Map" card shows the logical interfaces of the product. Use this card for PSMs that describe switches.

– "Traps" cards
The "Traps" card shows the traps received from HiVision.

Depending on the product, you can omit the card or define new ones.

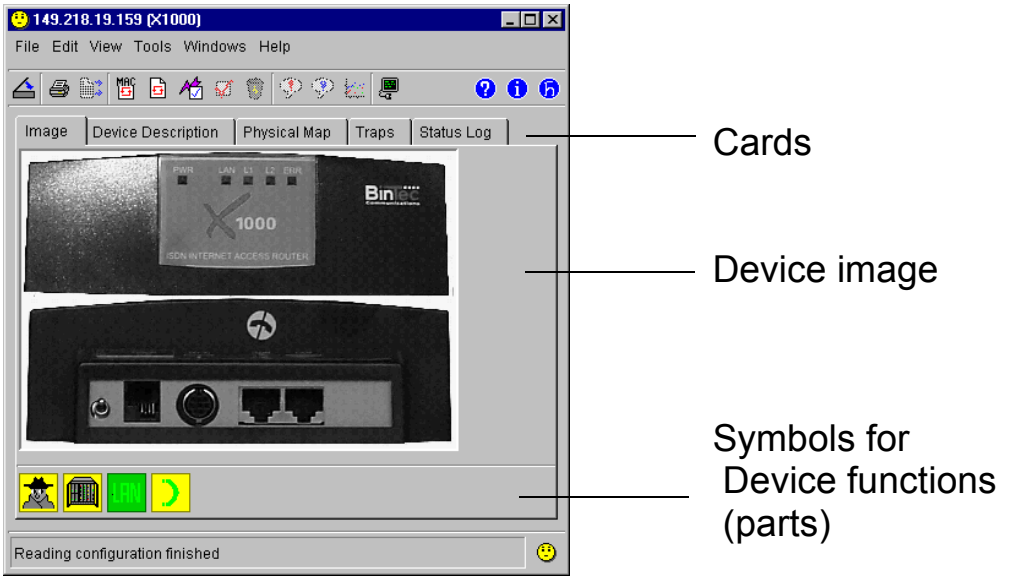

Fig. 61: PSM display in the device window

Displaying the agent in the Agent window

After double-clicking the Agent symbol in the Device window of an agent, the Agent window appears. Normally, it offers the card index with the following cards

– Configuration,
– Performance,
– Fault and
– Security.

You can create new cards or remove existing ones at any time.

As a rule, these cards are divided into a left and right area. The left side displays a tree for selecting details that are displayed on the right-hand side. HiVision provides two way to display these details:

– List display and
– Dialog display

The list display is to be used when you wish to have lines displayed as in a table.

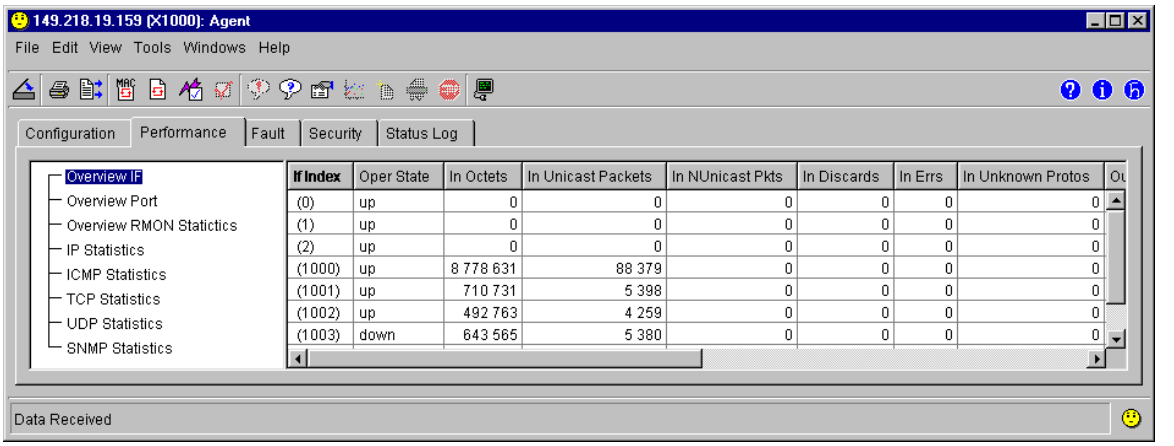
149.218.19.159 (X1000): Agent
File Edit View Tools Windows Help
Configuration Performance Fault Security Status Log
Overview IF
Overview Port
Overview RMON Statictics
IP Statistics
ICMP Statistics
TCP Statistics
UDP Statistics
SNMP Statistics
If Index | Oper State | In Octets | In Unicast Packets | In NUnicast Pkts | In Discards | In Errs | In Unknown Protos
(0) up 0 0 0 0 0 0
(1) up 0 0 0 0 0 0
(2) up 0 0 0 0 0 0
(1000) up 8 778 631 88 379 0 0 0 0
(1001) up 710 731 5 398 0 0 0 0
(1002) up 492 763 4 259 0 0 0 0
(1003) down 643 565 5 380 0 0 0 0
Data Received

Fig. 62: List display in the Agent window

The dialog display is designed for those cases in which you wish to view and edit a single-column matrix.

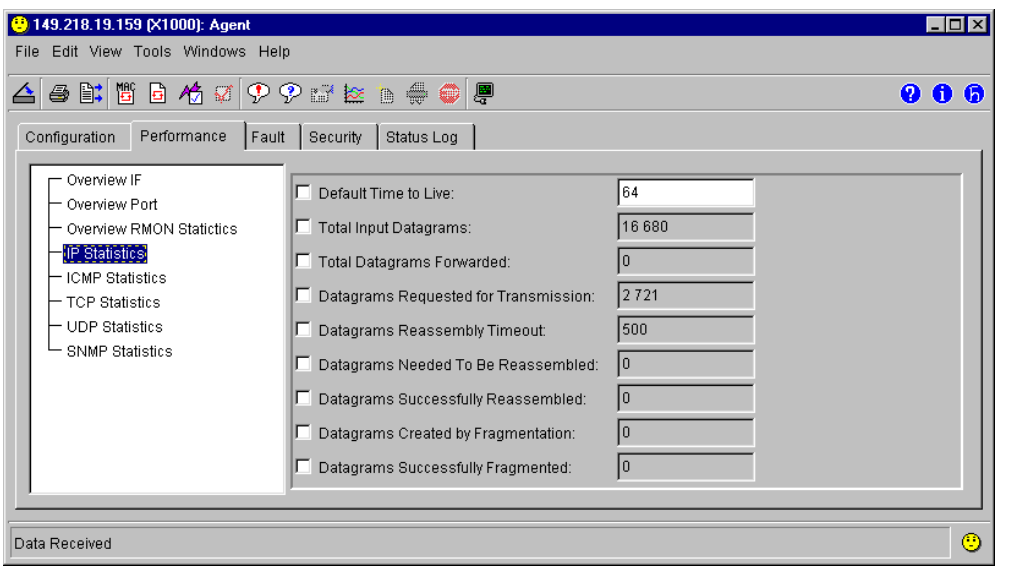

Fig. 63: Dialog display in the Agent window

8.1.2 Management Information Base

The Management Information Base (MIB) of the product that you wish to describe with the PSM should be available as a text file.
HiVision requires MIBs according to SMI V2.

8.1.3 Image file

The image file of the product that you wish to describe with the PSM should be available as a JPEG file. You will need an image resolution of 200 x 200 pixels up to 1000 x 800 pixels. If the image file is a color picture, convert it into a gray-scale image.

8.2 Creating a PSM structure

The first step in creating a new PSM is performed by HiVision. HiVision creates a directory structure for a new PSM for you. HiVision places so-called templates into the proper directories.
The templates are text files for describing the product to be integrated. They are given the necessary parameters that HiVision interprets using key words.

☐ Open HiVision.

☐ Select the `Configure PSMs...` command under `Configuration`.
This opens the window for configuring the PSM.

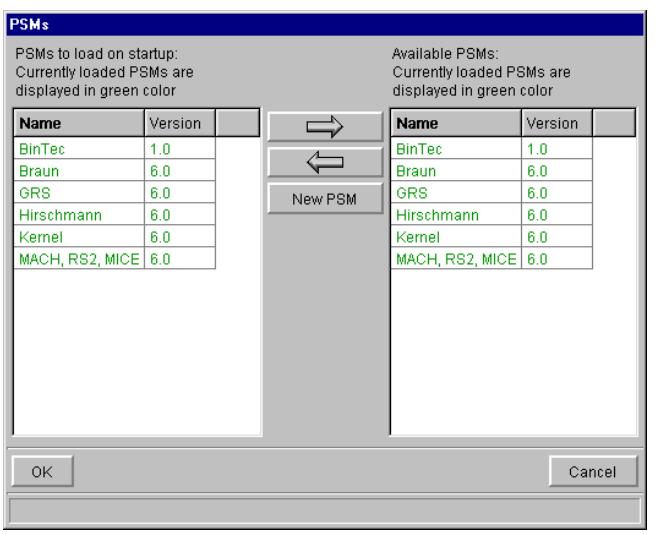

Fig. 64: Configuring the PSMs

☐ Click `New PSM`.
This opens the `New PSM` window.

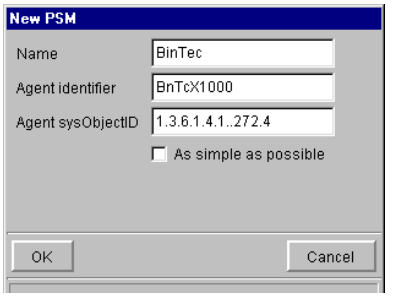

Fig. 65: New PSM

☐ Enter the name of the PSM after `Name`. HiVision uses this name to create the directory structure.
Enter the type designation after `Agent identifier`. Put a prefix before the type designation that uniquely identifies the manufacturer. The prefix "Hm" is reserved for Hirschmann.
Enter the system object identification (SysOID) of the product from the system table after `Agent sysObjectID`.
Check `As simple as possible`, if you want your PSM to include only a limited number of few functions. HiVision then combines the files `Agent.xml`, `AgentDialog.xml` and `Component.xml` into one file (see Fig. 66).

☐ Click `OK`.
The newly created PSM appears in blue in the column of available PSMs in the PSM Configuration window. The blue color indicates that HiVision has not yet loaded this PSM. Select the PSM and click the arrow pointing left. The PSM also appears in blue in the left column. HiVision will load this PSM when you restart the program.

In the meantime, HiVision has created the proper directory structure with the template in the HiVision directory. The templates already contain the values that you entered in `New PSM` window.

```
HiVision
  |-data
  |  |-BinTec
  |  |  |-bitmap
  |  |  |  |-BinTec.xpm
  |  |  |-config
  |  |  |  |-Agent.xml
  |  |  |  |-AgentDialog.xml
  |  |  |  |-Component.xml
  |  |  |  |-ProductFamily.xml
  |  |  |  |-PsmInfo.xml
  |  |  |  |-SysOidList.xml
  |  |  |-doc
  |  |  |-image
  |  |  |  |-X1000.jpg
  |  |  |-mib
```

Fig. 66: Directory structure with templates

☐ Quit HiVision.

8.2.1 MIB files

In order for HiVision to access the MIBs of the product (page 199), copy the MIB files in to the `mib` folder (see Fig. 66).

☐ Copy the private MIBs into the `mib` folder (see Fig. 66).

☐ Copy the standard MIBs that have not yet been loaded into the `mib` folder (see Fig. 66).
Standard MIBs that are loaded by HiVision are located in the `HiVision\data\kernel\mib` folder.

8.2.2 Manuals for the product

If you have manuals to your products as PDF files that you would like to describe with this PSM, copy these PDF files into the `doc` folder (see Fig. 66).

8.3 Agent in the main window

HiVision displays each agent in a line of the main window. The largest part of the display is taken up by HiVision polling the MIB variables of the agent. The display for the product family and the product name is defined in the PSM.

8.3.1 Product family symbol

To display an agent in the main window of HiVision, an image file that contains the product family symbol is required.
The sections "ProductFamily.xpm" on page 217 and "ProductFamily.xml" on page 217 describe this procedure.

8.3.2 Product name

HiVision displays the name in the "Product" column that you enter in the agent.xml file (see "Agent.xml" on page 218). HiVision refers to the assignment that follows the attribute `ChassisVar` or `ChassisFix`.

8.3.3 Agent status

To calculate the agent status, HiVision uses various information sources. One the one hand, HiVision checks the SNMP availability of the agent. On the other hand, you have the option of creating calculation formulas in the "Agent.xml" on page 218 that determine the agent status.

8.4 Agent in the Device window

In the templates, HiVision offers a standard display of the Device window. It already contains cards.

8.4.1 Cards

The `AgentDialog.xml` template already describes the HiVision standard cards. Modify the "AgentDialog.xml" on page 223 file to fit your needs.

8.4.2 Device image

An image file is required to display a device image in the HiVisionDevice window. The sections "Productimage.jpg" on page 215, "Component.xml" on page 231 and "AgentDialog.xml" on page 223 in the subdialog `Agent_Image` describe the size, the alignment as well as the definition of the card.

8.4.3 Symbols for device functions

You provide the symbols for the device functions as an xpm or bmp file. The symbols size is 26 x 26 pixels. Copy these symbols to the `bitmap` directory. Define the properties of the symbol according to the description in "Agent.xml" on page 218. Describe the dialog boxes that appear after you double-click the symbol in the `AgentDialog.xml` file as described on page 230.

8.5 Agent window

The "AgentDialog.xml" on page 223 file describes how the agent appears in HiVision:
– Agent window,
– Device window,
– Agent dialog boxes,
– Dialog boxes of the symbols for device functions.

8.5.1 List display

Examples for list dialog boxes can be found on page 226 in the description for the `AgentDialog.xml` file. In addition to the dialog type `EditList` there is also the dialog type `ShowList`. In a list of type `EditList` the values of the list can be edited. After double-clicking a line, HiVision offers an additional window for editing.

8.5.2 Dialog display

The example on page 224 shows the dialog display. It uses the `Dialog` dialog type. Define the variables for the dialog in a group.

8.6 Editing PSM files

As the file structure(see Fig. 66) shows, there are 7 files to be edited. These include configuration files in the XML format and also bitmap files.

The files in the XML format (V1.0) can be edited with a text or XML editor. The DTD files that describe the structure of the XML files, i.e. describe the visual text representation, are contained in HiVision.

The logical structure of the contents of the XML files consists of the definition of elements. An element can possess several attributes. Attributes are assigned a value:

```
<Element1 Attribute1="Value1" Attribute2="Value2" ></Element1>
```

or in the short form

```
<Element1 Attribute1="Value1" Attribute2="Value2"/>
```

These lines create the element `Element1` with the attributes `Attribute1` and `Attribute2`.

Elements can have subelements.

```
<Element1 Attribute1="Value1" Attribute2="Value2" >
   <Element2 Attribute1="Value3" />
   <Element2 Attribute1="Value4" />
</Element1>
```

Here, the element of type `Element1` has two subelements of type `Element2`. The subelements differ in the way they assign values.

Example for the PsmInfo.xml file:

```
<PsmInfo    Name="BinTec"
            Version="1.0"
            Copyright="Copyright 2001 Hirschmann Electronics .."
            Description="Definition of BinTec Router Agents">
      <File   Name="mibbipx.mib     "Type="Mib"/>
      <File   Name="mibbospf.mib    "Type="Mib"/>
      <File   Name="mibbox.mib      "Type="Mib"/>
</PsmInfo>
```

`PsmInfo`	corresponds to `Element1`
`Name`	corresponds to `Attribute1`
`BinTec`	corresponds to `Value1`
`Version`	corresponds to `Attribute2`
`1.0`	corresponds to `Value2`
`File`	corresponds to `Element2`
`Name`	corresponds to `Attribute1`
`BinTec`	corresponds to `Value1`

Tables in the sections for the individual files contain the possible elements and attributes.
The "Mandatory" column indicates whether the element /attribute is required in the file or can be used optionally.

Note: If the meaning column contains a default value, the entry is then required, but HiVision eliminates the need for entering an attribute. In this case, HiVision accepts the default value. In the example above, you are required to enter the attribute `Type` since the default value (`Config`), (see Table 14 on page 215) does not correspond to the value (`Mib`).

8.6.1 PsmInfo.xml

After opening the `PsmInfo.xml` file, check to make sure that HiVision has prepared the contents of the file as far as possible.

```
<PsmInfo    Name="BinTec"
            Version="1.0"
            Copyright="Copyright 2001 Hirschmann Electronics .."
            Description="Definition of BinTec Router Agents">
      <File       Name="mibbipx.mib          "Type="Mib     "/>
      <File       Name="mibbospf.mib         "Type="Mib     "/>
      <File       Name="mibbox.mib           "Type="Mib     "/>

      <File       Name="BnTcFamily.xml       "Type="Config  "/>
      <File       Name="SysOidList.xml       "Type="Config  "/>
      <File       Name="BnTcAgent.xml        "Type="Config  "/>

      <File       Name="BnTc_component.xml   "Type="Config  "/>
      <File       Name="BnTc_dialog.xml      "Type="Config  "/>

      <File       Name="BnTc_outname.xml     "Type="Config  "/>
</PsmInfo>
```

The file `PSMInfo.xml` represents, so to speak, the package contents of the PSM.
At first, the file contains general information such as name, version number, copyright, and a brief description. A list of data then follows that is a component of this PSM.

☐ Make the desired changes for the general information.

☐ List all file names of the MIBs that you have copied into the `mib` folder 8.2.1MIB files.
Pay particular attention to the order. HiVision reads the MIBs in the order they are listed in this file. A MIB that, for example, imports another MIB, cannot be loaded until the imported MIB has been loaded.

☐ A PSM contains the following configuration files:

Product family configuration file:
It defines information about the product family. Name the `ProductFamily.xml` template according to your product family.
(Example: `BnTcFamily.xml`).
This file can be omitted if you do not want a product family assignment.

System object identification file
This file contains the name of the products and their system object identifications (SysOid), that are described by the PSM.

Agent file
This file contains the general description of the agent of the PSM product. Name the `agent.xml` template according to its agent (Example: `BnTcAgent.xml`). If the PSM contains several agents, you can copy this file with the name of another agent or describe several agents in a single file.

Component file
This file contains the list of the product images. Name the `component.xml` template according to its agent (Example: `BnTc_Component.xml`).

Agent dialog file
This file describes the dialogs with agents of this PSM product. Name the template `AgentDialog.xml` according to its agent (Example: `BnTc_Dialog.xml`). If the PSM contains several agents, you can copy this file with the name of another agent or describe several agents dialogs in a single file.

MIB values assignment file
This files intended to give MIB variables
– Legible names for display in HiVision,
– Add attributes that are contained in the MIB but are required by HiVision.

Name the template `outname.xml` according to its agent (Example: `BnTc_outname.xml`).

Translation file
This file contains a list of terms for display in HiVision with the translation into the language used. Name the `LanguageTable.conf` template according to its agent (Example: `BnTc_LanguageTable.conf`). If the

PSM contains several agents, you can add a copy of this file with the name of another agent or describe several agents in a single file.
This file can be omitted if you only want to display agent-specific terms in a single language.

List all files that belong to your PSM in the `PsmInfo.xml` file.

☐ Save the file before closing.

Element	Attribute	Meaning	Mandatory	Number
PsmInfo		Defines PSM (name, version, ...) and names files that belong to the PSM		1
	Name	Name of the PSM	yes	
	Version	Version number of the PSM	yes	
	Description	Brief description of the PSM	yes	
	Copyright	Copyright string	yes	
File		Subelement of PsmInfo List of files that belong to the PSM		any
	Name	File name	yes	
	Type	Type of the file. Possible are: Mib, Config or Language default: Config	optional	

Table 14: Element list for the PSM information

8.6.2 Productimage.jpg

This file represents the gray-level image of the product.
Place the product image of "Image file" on page 199 in the `image` folder (see Fig. 66). If several products belong to the PSM, place all the image files of this PSM in this folder.

8.6.3 SysOidList.xml

The system object identification list (SysOid) contains the names of the products that belong to this PSM and are to be detected by HiVision. If HiVision detects a known SysOid during a network scan, HiVision creates a record for this agent with this agent type.

```
<Resources>
      <AgentSysOid
         SysOid="1.3.6.1.4.1.272.4"
         AgentID="BnTcX1000"          />
</Resources>
```

☐ HiVision has already entered the name and the SysOid of the product in the file that you entered when you created the new PSM.
If the PSM is to contain more than this product, add one element to this file for each new product.

```
<Resources>
      <AgentSysOid
         SysOid="1.3.6.1.4.1.272.4"
         AgentID="BnTcX1000"          />
      <AgentSysOid
         SysOid="1.3.6.1.4.1.xy.4"
         AgentID="Phantastic"          />
</Resources>
```

☐ Save the file before closing.

Element	Attribute	Meaning	Mandatory	Number
AgentSysOid		Assigning SysOids to agents		any
	SysOid	SysOid that is assigned to the following agent. Wildcards (* only) are permitted on the end	yes	
	AgentID	ID of an agent defined in agent.xml	yes	

Table 15: Element list for the system object identification list

8.6.4 ProductFamily.xpm

HiVision display the symbols of the product family which the agent in this line belongs to in the left column of the agent card in the main window.

☐ Create a bitmap file that displays the symbol for each product family. Save the bitmap file in the XPM or BMP format in the `bitmap` folder. HiVision places an XPM template in the `bitmap` folder. The file has a size of 20 x 20 pixels. Transparent surfaces for the status display are possible for files in the XPM format.

8.6.5 ProductFamily.xml

In the main window, HiVision displays the symbols of the product family which the agent in this line belongs to in the left column of the agent card.

```
<Resources>
   <ProductFamily
         ProductFamilyID="BnTcBinTec-Router"
         Label="BinTec-Router"
         Symbol="BnTcRouter.xpm"
         SortIndex="210" />
</Resources>
```

☐ Enter the identification of the product family after `ProductFamilyID`. Add a prefix that uniquely identifies the manufacturer. The prefix "Hm" is reserved for Hirschmann.

☐ Enter the product family name after `Label` that is to be displayed in HiVision. HiVision displays the product name in a speech bubble once you place the mouse pointer on the symbol.

☐ Enter the name of file that contains the symbol of the product family after `Symbol`(see "ProductFamily.xpm" on page 217).

- Enter a whole number with which you can influence the sort order in the main window of HiVision after `SortIndex`.
  The permissible number range is 200 to 999. The smaller the number, the higher the agent appears in the list.

- If your PSM contains more that one product family, enter an element for each product family.

8.6.6 Agent.xml

This file describes the line of the agent of the product as it appears in the main window of HiVision and determines the status display. The status display also includes the symbols in the status line of the Device window as well as the definition of the status forwarding.

```
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->
<!-- X Definition Main window                                          X-->
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->

   <Agent   AgentID="BnTcX1000"
            ProductFamilyID="BnTcBinTec-Router"
            ChassisVar="sysDescr.0"
            ProductVar="sysDescr.0"
            SwVersionVar="biboAdmSWVersion.0"
            SupportsTelnet="Yes"
            CalcPhysState="Yes"
            PhysStateName="Physical State">
```

The upper section of this files describes the agent line in the main window. This is where you determine what is to appear in the columns of the agent line, whether HiVision activates the Telnet function and how HiVision forwards the physical status.

The lower section of this file describes the symbols for the device-specific functions (parts). Here you determine which file contains the symbol, what the symbol is to be called, and from which MIB variables the status of the symbol is calculated.

```
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->
<!-- X Definition symbols of device functions                              X-->
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->

            <Part  PartID="LAN_Button"
                   Label="$$LANSTATUS"
                   Symbol="LAN.xpm"
                   Instance="3"
                   ExprAvailable="ifOperStatus.1000.3!=0">
                   <PartStatus
                         Name="LAN-Status"
                         ExprOk="ifOperStatus.1000.3==1"
                         ExprWarning="ifOperStatus.1000.3==5"
                         ExprError="ifOperStatus.1000.3==2"
                   />
            </Part>
            <Part  PartID="ISDN_Button"
                   Label="$$ISDNSTATUS"
                   Symbol="ISDN.xpm"
                   Instance="7"
                   ExprAvailable="ifOperStatus.10001.7!=0">
                   <PartStatus
                         Name="ISDN-Status"
                         ExprOk="ifOperStatus.10001.7==1"
                         ExprWarning="ifOperStatus.10001.7==5"
                         ExprError="ifOperStatus.10001.7==2"
                   />
            </Part>
   </Agent>
```

The following list contains the definition of the possible elements and attributes:

Element	Attribute	Meaning	Mandatory	Number
Agent		Agent definition		any
	AgentID	String for communication with the agent (AgentDialog.xml).	yes	
	ProductFamilyID	Assigns the agent to this family. To set this value, see ProductFamily.xml	yes	
	ChassisVar	This variable holds the chassis name. HiVision displays this name in the "Product" column of the main window.	optional	

Table 16: Element list for the appearance of the agent

Element	Attribute	Meaning	Mandatory	Number
	ChassisFix	Permanent assignment of the chassis name. HiVision displays this name in the "Product" column of the main window.	optional	
	DialogSelectVar	Selects a product version.	optional	
	SwVersionVar	This variable holds the software version.	optional	
	ShowSpecial-Info	Possible: Yes or No, default: Yes	optional	
	SupportsTelnet	Supports the Telnet agent. Enter 'Yes' so that HiVision activates the menu item, Possible: Yes or No, default: No	optional	
	CalcPhysState	Calculate physical status, Possible: Yes or No, default: No	optional	
	PhysStateName	Name of the physical status to be displayed in the speech bubble help, default: physical state	optional	
	CalcLogState	Calculate logical status, Possible: Yes or No, default: No	optional	
	LogStateName	Name of the logical status to be displayed in the speech bubble help, default: logical state	optional	
SpecialInfo		Subelement of agent Variables that are to be displayed in SpecialInfo, Without entry no special info is displayed - with entry but without variable, the default special info will be displayed (supported MIBs) - the text is displayed for each variable - several variable are possible: Display: in picture: separated by commas in the speech bubble help: in new line		any
	Text	Text to be displayed	yes	
	MibVariable	The content of the variable is displayed	yes	
	Instance	Poll variable with this instance This instance is also used to differentiate between identical function symbols, for example power supplies, see also "Agent.xml" on page 218.	optional	
	EnumString	For Enums: use EnumString instead of the integer, Possible: Yes or No, default: No	optional	
BubbleHelp		Subelement of agent Variables that are to be displayed in the speech bubble agent		any
	Text	Text to be displayed	yes	

Table 16: Element list for the appearance of the agent

Element	Attribute	Meaning	Mandatory	Number
	MibVariable	Contents of the MIB variable that is to be displayed	yes	
	Instance	Poll variable with this instance	optional	
	EnumString	for Enums: use EnumString instead of the integer, if possible Yes or No, default: No	optional	
IgnoreTrap		Subelement of agent Normally, all variable traps are examined that contribute to the status. Here you can make the setting that this trap should not be used for status changes.		any
	TrapName	MibName of the trap	yes	
Part		Subelement of agent Definition of a symbols for displaying device-specific functions		any
	PartID	Symbol ID (Reference for Agent_Dialog.xml)	yes	
	Label	Name of the symbol for display	yes	
	Symbol	Symbol icon for display see "ProductFamily.xpm" on page 217	yes	
	Instance	Instance of the symbol (number)	yes	
	Position	Position of the symbol (see "Component.xml" on page 231)	optional	
	HideInstance	In the physical representation, the display of the instance is suppressed (helpful if only one instance can exist) possible: Yes or No, default: No	optional	
	ExprAvailable	Formula indicating whether the symbol exists: if there is no formula, the symbol is always created	optional	
PartStatus		Subelement of Symbol (not of agent) Definition of a subsymbol status. A symbol can have several substatuses		any
	Name	Name of the status (speech bubble help)	yes	
	ExprOk	Formula with variable and instance for OK status (green)	yes	
	ExprWarning	Formula with variable and instance for warning status (yellow)	optional	
	ExprError	Formula with variable and instance for error status (red)	optional	

Table 16: Element list for the appearance of the agent

Variable

In order for HiVision to determine the correct value of a variable, it is necessary to indicate an instance for the variable,
for example: hmChassisName.1. The correct instanz of a variable you can find with an SNMP browser.
A variable can be assigned to a number or string. Via SNMP, a variable is often output as a number that has been assigned a string according to the MIB definition. In this case, the number is called "ENUM", and the assigned string "ENUMSTRING."
In case you wish to replace an ENUM with a ENUMSTRING, insert "ENUMSTRING" after the instance,
for example: hmProduct.1:ENUMSTRING.

Status display

The formula for calculating the status can have constants and any number of variables. All variables in the formula are to be specified with an instance.
The worst case of the individual statuses are always displayed in the main window.

The table lists the permissible operands for the calculation formula (see Tab. 17 on page 222). Operators with a higher priority are executed first. Parenthetical expresions with （ and ） are permitted. The formula is considered fulfilled if the result is not equal to 0. The calculation syntax follows that of the C programming language).

Operator	Meaning	Priority	Parameter
==	equal to	3	numbers or strings
!=	not equal to	3	numbers or strings
	larger than	5	numbers or strings
=	larger than or equal to	5	numbers or strings
<	smaller than	4	numbers or strings
<=	smaller than or equal to	4	numbers or strings
&&	logical And	2	numbers
||	logical Or	1	numbers
&	bitwise And	9	numbers
|	bitwise Or	8	numbers
^	bitwise Exclusive Or	10	numbers

Tab. 17: Operators for determining the status

Operator	Meaning	Priority	Parameter
+	addition	6	numbers or strings
-	subtraction	6	numbers
*	multiplication	7	numbers
/	division	7	numbers
%	modulo	7	numbers
!	not (unary)	11	numbers
-	negative sign (unary)	11	numbers
~	complement (unary)	11	numbers

Tab. 17: Operators for determining the status

8.6.7 AgentDialog.xml

This file describes the dialogs. The structure is hierarchical. The description of the contents of the first window is at the beginning. This is followed by the description of the contents of the windows that appear in the first window as the consequence of an action.

Definition of the card index in the device window

The `AgentDialog.xml` file begins with the definition of the card index in the device window:

```
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->
<!-- X Definition Main window                                          X-->
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->

<Resources>
   <Dialog  Name="Agent_Device"
            Type="TabBook"
            Title="%IpAddr"
            AgentID="BnTcX1000">
      <SubDialog Name="Agent_Image" />
      <SubDialog Name="Agent_DeviceDescription" />
      <SubDialog Name="Agent_PhysMap" />
      <SubDialog Name="Agent_Trap" />
   </Dialog>
```

The first block determines the card index and which index cards are located in the card index of the Device window.

```
<!-- X Definition cards / Karteikarten -->
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->

  <Dialog   Name="Agent_Image"
            Type="AgentImage"
            Title="$$IMAGE"
            AgentID="BnTcX1000">
  </Dialog>

  <Dialog   Name="Agent_PhysMap"
            Type="AgentPhysMap"
            Title="$$MAP"
            AgentID="BnTcX1000">
  </Dialog>

  <Dialog   Name="Agent_LogMap"
            Type="AgentLogMap"
            Title="$$AGENT_LOGICAL_MAP"
            AgentID="BnTcX1000">
  </Dialog>

  <Dialog   Name="Agent_Trap"
            Type="TrapLog"
            Title="Traps"
            AgentID="BnTcX1000">
  </Dialog>

  <Dialog   Name="Agent_DeviceDescription"
            Type="Dialog" Title="$$DEVICEDESCRIPTION"
            AgentID="BnTcX1000">
         <Group Name="Group_BnTcX1000_DeviceDescription" />
  </Dialog>
```

The second block determines the contents of the cards in the card index. These cards can contain an image, the logical or physical structure, a trap list etc. (see Table 19 on page 228).

```
<MibGroup   Name="Group_BnTcX1000_DeviceDescription">
   <MibName Name="sysDescr" Instance="0" />
   <MibName Name="sysDescr" Instance="0" />
   <MibName Name="sysDescr" Instance="0" />
   <MibName Name="sysContact" Instance="0" />
   <MibName Name="sysName" Instance="0" />
   <MibName Name="sysLocation" Instance="0" />
</MibGroup>
```

The third block describes, if needed, the details of the window contents.

Definition of the Agent window

The Agent window definition in the `AgentDialog.xml` file follows the definition of the card index in the device window, the definition of.

```
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->
<!-- X Definition Agent window (card index / Karteikasten)   X-->
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->

   <Dialog  Name="Agent"
            Type="TabBook"
            Title="%IpAddr: Agent" *
            AgentID="BnTcX1000">
      <SubDialog Name="Agent_Configuration" />
      <SubDialog Name="Agent_Performance" />
      <SubDialog Name="Agent_Fault" />
      <SubDialog Name="Agent_Security" />
   </Dialog>
```

* `%IPAddr` ist eine Variable, siehe "Variables for agent dialogs" on page 229.

The first block determines the card index and which cards are located in the card index of the Agent window.

```
<!-- X Definition cards / Cards -->
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->

   <Dialog  Name="Agent_Configuration"
            Type="TreeBook"
            Title="$$CONFIGURATION" *
            AgentID="BnTcX1000">
      <SubDialog Name="Agent_Trap_Destination" />
      <SubDialog Name="Agent_ISDN_Call_Table" />
      <SubDialog Name="IP_Route_Table" />
</Dialog>
```

* `$$` represents a variable, see "Variables for agent dialogs" on page 229.

The second block determines the contents of the cards in the card index. These cards can contain the most varied information (see Table 19 on page 228).

```
   <Dialog  Name="Agent_Trap_Destination"
            Type="EditList"
            Title="Trap Destination"
            AgentID="BnTcX1000">
      <VarName Name="biboAdmTrapHostAddr" />
      <VarName Name="biboAdmTrapHostStatus" />
   </Dialog>

   <Dialog  Name="Agent_ISDN_Call_Table"
            Type="ShowList"
            Title="ISDN Call Table"
            AgentID="BnTcX1000">
      <VarName Name="biboDialIfIndex" />
      <VarName Name="biboDialType" />
      <VarName Name="biboDialDirection" />
      <VarName Name="biboDialNumber" />
      <VarName Name="biboDialSubaddress" />
      <VarName Name="biboDialClosedUserGroup" />
      <VarName Name="biboDialStkMask" />
      <VarName Name="biboDialScreening" />
   </Dialog>
```

The third block describes, if needed, the details of the window contents.

The template contains the standard dialogs created by HiVision.

☐ Check which existing dialogs are useful for describing your product. Make the necessary changes to the file and add any information you may need.

Elements and attributes for the AgentDialog.xml file

The elements and attributes in the table below are for describing the dialogs.

Element	Attribute	Meaning	Mandatory	Number
Dialog		Definition of a dialog box		any
	Name	Name of the dialog box	yes	
	Type	Type of the dialog box, see "List of the dialog types" on page 228	yes	
	Title	Dialog-box heading, variables are permitted, see "Variables for agent dialogs" on page 229	yes	
	AgentID	Applies to this agent type	optional	
	Parameter	Parameter (depend on the dialog type) see "Parameter list for dialog types" on page 230	optional	
	Instance	Normal dialog box: The instance is formed from the values of these variables. Numbering begins with 0! The instance cannot be edited. Example: "0,1,2": The instance is based on the first 3 values of the dialog.	optional	
	LoadOnPopup	When a subdialog is opened, the MIB variables are reread. Possible: Yes or no, default: No	optional	
	OneVarPerSetPdu	Dialog: when making the setting, always pack one variable into a PDU, in case the agent accepts only one variable per PDU. Possible: Yes or no, default: No	optional	
DialogSelect		The dialog applies only to DialogSelect. The agent determines its DialogSelect through DialogSelectVar in Agent.xml.		any
	Name	DialogSelect = Contents of DialogSelectVar.	yes	
SubDialog		Subelement of dialog subdialog only in TabBook or TreeBook		any
	Name	Name of the subdialog	yes	
Group		Subelement of dialog only normal dialog: The variables of this group are displayed in the dialog		any
	Name	Dialog displays this group of variables	yes	

Table 18: Element list for the appearance of the Agent dialog boxes

Element	Attribute	Meaning	Mandatory	Number
VarName		Subelement of dialog Only in ListDialogs: Display these variables		any
	Name	Name of the Mib variables	yes	
	ReadOnly	MibVariable is read-only for this dialog: Yes or no, default: No	optional	
	Instance	Do not query variable, but extract it from the Oid of the first queried variable, see Determining variable from the instance	optional	
VarOid		Subelement of dialog only List dialogs: Only use display these variables, if the MibName is not unique!		any
	Oid	Oid of the Mib variables	yes	

Table 18: Element list for the appearance of the Agent dialog boxes

The list of dialog types demonstrates the possibilities that HiVision provides for dialogs.

Dialog type	Description
TabBook	Subdialog with several cards
TreeBook	Subdialog with branches
AgentList	HiVision main list
VlanConfiguration	VLAN Manager (Main list)
TrapLog	Trap log (main list and agent level)
MessageLog	Message log (main list and agent level)
SyntaxCheckerLog	Log of the syntax checkers (main list)
AgentPhysMap	Physical map of the agent (agent housing card/ module port)
AgentLogMap	Logical map of the agent (agent interface)
AgentImage	Image of the agent
Dialog	Normal SNMP dialog (Reload, Set)
PollDialog	Dialog as in Dialog. It polls however. Interval can be set (see Table 21 on page 230)
MacAddrList	MacAddr list: dot1dTpFdb (possible on agents or port level)
ShowList	List dialog for display (Reload, Stop, Properties)

Table 19: List of the dialog types

Dialog type	Description
EditList	List dialog for editing (Reload, Stop, Properties, if variable with DELETE_VALUE: New and Delete)
Rmon1Dialog	Rmon diagram with statistics data
Rmon2Dialog	Rmon diagram with log data
Rmon3Dialog	Rmon diagram with Alams
Rmon1List	Rmon list of the statistic data (for printing)
Rmon2List	Rmon list of the log data (for printing)

Table 19: List of the dialog types

The variable list for agent dialogs shows the placeholders that HiVision provides. Placeholders make it possible to define a display whose contents is read from an MIB.

Keyword	Meaning
$$TOKEN	Keyword from the "LanguageTable.conf" on page 233 translation files
%IpAddr	IP address of the agent with the name in parentheses (if present)
%PartName	Name of the part
%agentNo	Number of the agent (normally 1)
%ipAddr	IP address of the agent
%boxNo	Number of the housing (always 1)
%portNo	Number of the port
%interfaceIndex	Number of the interface (ifIndex from MIB II)
%partNo	Number of a symbol for device-specific function

Table 20: Variables for agent dialogs

The parameter list shows the parameters that use the various dialog types.

Dialog type	Parameter	Meaning
Rmon1Dialog Rmon2Dialog	"Performance" "Fault	"Performance Dialog Fault Dialog
Dialog	"Options": GrapherSelectAll GrapherPolling-Time=SEC GrapherOpen=TAB	Options, separated by commas (","). Possible options: All variables preselected for Grapher Polling intervall for Grapher: SEC in seconds Grapher opens with TAB (graph, pie, table)
PollDialog	DialogPolling-Time=SEC	Polling interval for Polling Dialog: SEC in seconds (default: 5)

Table 21: Parameter list for dialog types

Definition of the Symbol dialog

At the end of the file the dialogs of symbols for device functions are defined.

```
<!-- Definition Symbol dialog -->
<!-- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX-->

   <Dialog  Name="Agent_Trap_Destination"
            Type="TabBook"
            Title="$$ISDNSTATUS"
            AgentID="BnTcX1000">
            <SubDialog Name="Agent_ISDN_Call_Table" />
  </Dialog>
```

In the example above, double-clicking the "ISDN Button" symbol opens the subdialog ISDN Call Table.

8.6.8 Component.xml

This file describes which image file HiVision assigns to the PSM products and sets the image display.

```
<Resources>
  <Component  Name="X1000"
              Orientation="Vertical"
              Width="1336"
              Height="917"
              Zoom="250"
              Image="X1000sw.jpg"
  </Component>

  <Component  Name="BINTEC-X4000"
              Orientation="Vertical"
              Width="735"
              Height="857"
              Zoom="500"
              Image="x4000sw.jpg"
  </Component>

</Resources>
```

- ☐ For `Name` enter exactly the name that you have defined in the `agent.xml` file with `ChassisVar` or `ChassisFix`.
- ☐ `Orientation` indicates the length of the image. `Vertical` is set by default. `Horizontal` is also possible.
- ☐ Enter the width and height of the product image for the variables `Width` and `Height`.
- ☐ With the value for `Zoom` you can set the size with which HiVision displays the product image in the device window.
  The value 1000 stands for the factor 1.
- ☐ Enter the file name of the product image for `image`.
- ☐ If the PSM describes several products, repeat the procedure for each product.

8.6.9 outname.xml

Use this file to assign additional attributes to an MIB variable .

```
<Resources>
   <Mib variable  Name="biboAdmTrapHostStatus"
                  Label="Status" DeleteValue="2">
   </MibVariable>
   <Mib Variable  Name="biboAdmTrapHostStatus"
                  Label="TrapHostAddr">
   </MibVariable>
</Resources>
```

In the example above, two MIB variables are given new attributes.
The assignment `Label=”Status”` causes the name `biboAdmTrapHost-Status` to be replaced by the display `Status`.
The assignment `DeleteValue="2"` informs HiVision to provide a selection field called `delete` and permit a new entry. This assignment requires HiVision, if no corresponding value exists in the MIB for the MIB variable.

Element	Attribute	Meaning	Mandatory	Number
MibVariable		Description of an MIB variable		any
	Name	Name of the variable (from MIB)	yes	
	Label	This value is displayed in the dialog	optional	
	DeleteValue	This value allows you to delete and create a table line	optional	
	Default-Value	This value is displayed by default upon creation	optional	
	OffsetValue	Offset is subtracted from the variable for display	optional	
	Creatable	This value is not required when created Possible: Yes or No, default: Yes	optional	
	BitString	The string is displayed as a hex (01 02 FF) or decimal (001 002 256) number: Hex or Dec	optional	
AllowedValue		Subelement of MibVariable for string: display popup, not edit field		any
	Value	Display these values as popup	yes	
MapValue		Subelement of MibVariable Definition of an Enums here. Display as popup.		any
	Value	Value	yes	

Table 22: Element list for assigning values to MIB variables

Element	Attribute	Meaning	Mandatory	Number
	Output	Display string	yes	
ReadOnlyValue		Subelement of MibVariable Definition of values that should not be written		any
	Value	Do not write this value	yes	

Table 22: Element list for assigning values to MIB variables

8.6.10 LanguageTable.conf

The language table is for adapting the PSM to various languages. HiVision can translate terms that are displayed in the dialogs by using the variables (see Table 20 on page 229) with the help of the language table. Two preceding $ signs identify a variable that HiVision translates using the language table (language table).

The following rule applies for the structure of the LanguageTable.conf file:

– Each line begins with the name of the variable to be translated followed by the language ID and the translation term.
– Variable, language ID and translation term are separated by a tab or blanks.
– Should the translation be followed by a blank, separate the variable from the language ID with an additional blank.
– The language IDs are:
  ENG for English,
  GER for German,
  FRE for French,
  SPA for Spanish.
– Enter one line per language for each variable. If a line is missing for a language, HiVision then inserts the English term.
– The #-character identifies the start of a comment. A comment ends with the end of a line
– If an entry consists of several lines, "/n" creates a line feed.

```
#############################################################
#
#  LanguageTranslationTable File
#
#  Supported Languages:
#     ENG            English
#     GER            German
#
#############################################################

#################### english ################################

LANSTATUS      ENG    LAN state
ISDNSTATUS     ENG    ISDN state

#################### german ##################################
LANSTATUS            GER           LAN-Status
ISDNSTATUS           GER           ISDN-Status
```

8.7 Testing PSM

Starting HiVision with command-line parameter
`-SyntaxChecker`
causes HiVision to check the embedded PSMs for syntax error and consistency. The syntax error and consistency testing are subject to:

- Dialogs
- Components
- Product families
- AgentSysOids
- Agents
- AddMibAttributes (outname.xml)
- MibGroups
- Used MIB variables

Dialogs

The syntax checker checks the following criteria in the `AgentDialog.xml` file:
– Are all subdialogs present?
– Are not-used dialogs defined?
– Are dialogs repeated?
– Are the groups used available?
– Can the title be translated into the language set?
– Can the placeholders (%portNo) be translated?
– Are all dialogs available (Agent, Agent_Description, Function symbol dialogs)?

Components:

The syntax checker checks the following criteria in the `Component.xml` file:
– Are any components repeated?
– If the component defines an image, does the image exist?

Product families

The syntax checker checks the following criteria in the `ProductFamily.xml` file:
– Are any components defined more than once?
– Is a sort index used more than once?
– Does the icon exist?

AgentSysOids

The syntax checker checks the following criteria in the `SysOIDList.xml` file:
– Is a SysOid used more than once?
– Does the AgentID exist?

Agents

The syntax checker checks the following criteria in the `agent.xml` file:
– Do the MIB variables exist that are used in `ChassisVar`, `DialogSelectVar`, `SWVersionVar`, `SpecialInfoVar` und `BubbleHelpVar`
– Do the traps exist that are specified in `IgnoreTrap`?

AddMibAttributes

The syntax checker checks the following criteria in the `Outname.xml` file:
– Are MIB variables defined twice?

MibGroups

The syntax checker checks the following criteria in all dialogs:
– Are groups defined more than once?
– Are superfluous groups defined?
– Are MIB variables repeated in a group?
– Is the MIB access list valid?

Used MIB variables

The syntax checker checks the following criteria in the `outname.xml` file and in the loaded MIBs:
– Does variable exist in MIB?
– Does variable exist in outname.xml?

Error messages:
Dialog XXX defined but not used
Dialog XXX found YYY times
Dialog XXX not found
Group XXX not found
Dialog XXX: title cannot be translated: title: YYY
Dialog XXX: title with part token cannot be translated: title: YYY
Component XXX defined twice!
Component XXX: image YYY not found
Product Family XXX: uses same SortIndex as YYY, SortIndex: ZZZ
Product Family XXX: Symbol YYY not found
Agent SysOid Entry XXX found twice
Agent SysOid Entry: AgentID not found: YYY
Agent XXX: YYY: Mib Variable ZZZ not defined in loaded MIBs
Agent XXX: YYY: Trap ZZZ: not defined in loaded MIBs
Additional MIB Attribute for Mib Variable XXX: defined twice
Mib Variable XXX: not defined in loaded Mibs
Mib Variable XXX: not defined in loaded Mibs
Group XXX: defined twice
Group XXX: not used
Group XXX: Mib Variable YYY: defined twice
Group XXX: mib access list cannot be translated: access: YYY

Table 23: List of the possible error messages

Error status	Result
Info	For information on the results
Warning	Can cause errors. Does not impair HiVision operation.
Error	Error impairs HiVision operation. Modification necessary.

Table 24: Error results

Tips for testing PSMs:

- Deactivate HiVision with `Configuration:Configure PSMs`... all PSMs that HiVision should not check. This shortens the start phase.
  When HiVision is restarted, HiVision performs a syntax check.
- You can carry out this test while creating the PSM without having to completely edit the PSM. Save the current PSM files before the test.

A Appendix

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Frequently asked questions

Answers to the frequently asked questions can be found on Hirschmann's Internet site:

`www.hirschmann.de`

in the Automation and Network Solutions Devision on the sides `SERVICES` there is the category `FAQ` with `HiVision`.

Data access definitions for OPC servers

Validity / Device Class	All network components managed by HiVision
OPC Source Path	IP address.Device.Management.Device Status
Returned Value	0 = Unknown 1 = Ok 2 = Warning 3 = Error

Tab. 25: Device status query of an SNMP agent managed by HiVision

Event definitions for OPC servers

Validity / Device Class	HiVision network management software
OPC Event Type	Simple
OPC Category ID	ConnectResult
OPC Source Path	Application.Connection Netmanager
OPC Severity	1000 (error), 600 (ok)
OPC Message	Information on result of attempt to connect to HiVision
Additional OPC Attributes:	
– Result	0 = Connection failed 1 = Connection successful

Tab. 26: Connection event with HiVision

Validity / Device Class	All SNMP-compatible network components
OPC Event Type	Simple
OPC Category ID	SimpleSnmpTrap
OPC Source Path	Device.Management.Cold Start
OPC Severity	800
OPC Message	Information on device cold start
Additional OPC Attributes:	
– IP Address	IP address of the device

Tab. 27: Device cold start

Validity / Device Class	All SNMP-compatible network components
OPC Event Type	Simple
OPC Category ID	SimpleSnmpTrap
OPC Source Path	Device.Management.Warm Start
OPC Severity	800
OPC Message	Information on device warm start
Additional OPC Attributes:	
– IP Address	IP address of the device

Tab. 28: Device warm start

Validity / Device Class	RS2, MACH 3000
OPC Event Type	Simple
OPC Category ID	SimpleSnmpTrap
OPC Source Path	Device.Management.Self-test error
OPC Severity	1000
OPC Message	Information on error during self-test
Additional OPC Attributes:	
– IP Address	IP address of the device

Tab. 29: Self-test error

Validity / Device Class	All network components managed by HiVision
OPC Event Type	Simple
OPC Category ID	DeviceStatus
OPC Source Path	Device.Management.Device-Status
OPC Severity	Depending on Status: 400 (Unknown), 600 (Ok), 800 (Warning), 1000 (error)
OPC Message	Information on device status value
Additional OPC Attributes:	
– IP Address	IP address of the device
– Status	Status in plain text
– Status-ID	0 = Unknown 1 = Ok 2 = Warning 3 = Error

Tab. 30: Change of device status of an SNMP agent managed by HiVision

Validity / Device Class	MACH 3000
OPC Event Type	Simple
OPC Category ID	DuplicateStaticAddress
OPC Source Path	Device.Management.Duplicate Static Address
OPC Severity	800
OPC Message	Information on duplicate Unicast MAC addresses on multiple agents in the same housing.
Additional OPC Attributes:	
– IP Address	IP address of the device
– Static MAC Address	Duplicate MAC address entry

Tab. 31: Duplicate address table entry

Validity / Device Class	RS2
OPC Event Type	Simple
OPC Category ID	SimpleSnmpTrap
OPC Source Path	Device.Management.Standby-Mode
OPC Severity	200
OPC Message	Information on modified standby mode
Additional OPC Attributes:	
– IP Address	IP address of the device
– RS2-Opermode	1 = normal 2 = standby-active 3 = standby-inactive 4 = redundancy-manager-active 5 = redundancy-manager-inactive

Tab. 32: Modified standby mode

Validity / Device Class	MACH 3000
OPC Eventtype	Simple
OPC Category Identifier	DualHomingReconfig
OPC Source Path	Device.Management.DualHoming.DuhmReconfig
OPC Severity	Depends on the values of OperstatePrimConn and Operstate-RedConn: if prim. connection active: 600 if prim. and red. connction avtive: 600 if prim. inactive and red. aktiv: 800 else (not a regular condition): 200
OPC Message	Text informing about the new redundancy conditions
Zusätzliche OPC Attribute:	
– IP-Address	IP-Address of device
– GroupIdPrimary-Connection	Group-Id of the primary connection
– InterfaceIdPrimary-Connection	MIB-2 IF-index of the primary connection
– OperstatePrimConn	1 = not available 2 & 3 = active 4 & 5 = inactive
– GroupIdRedundant-Connection	Group-Id of the redundant connection
– InterfaceIdRedundant-Connection	MIB-2 IF-index of the redundant connectionOperstateRedConn 1 = not available 2 & 3 = active 4 & 5 = inactive

Tab. 33: Dual Homing - Configuraton changed

Validity / Device Class	MACH 3000
OPC Eventtype	Simple
OPC Category Identifier	DualHomingRedundancy
OPC Source Path	Device.Management.DualHoming.DuhmRedundancy
OPC Severity	Depends on the redundancy status: 600 (ok), 800 (failed)
OPC Message	Text informing about the availability of redundancy
Zusätzliche OPC Attribute:	
– IP-Address	IP-Address of device
– RedundancyState	Status of the availability of redundancy: 1 = ok 2 = failed

Tab. 34: Redundancy state

Validity / Device Class	MACH 3000
OPC Eventtype	Simple
OPC Category	Identifier RingRedReconfig
OPC Source Path	Device.Management.RingRedundancy.RingRedReconfig
OPC Severity	Depends on the redundancy status: 200 (under creation), 600 (rmInactive or rs), 800 (rmActive)
OPC Message	Text informing about the new redundancy conditions
Zusätzliche OPC Attribute:	
– IP-Address	IP-Address of device
– RingRedOperState	1 = under creation 2 = rmActive (red. connection active, no redundancy furthermore) 3 = rmInactive (normal state, redundancy granted) 4 = rs (ring switch: Agent acts as normal switch in this ring)

Tab. 35: HIPER-Ring changed

Validity / Device Class	MACH 3000
OPC Eventtype	Simple
OPC Category	Identifier NewUser
OPC Source Path	Device.Management.UserGroups.NewUser
OPC Severity	800
OPC Message	Text informing that a user, that couldn't be found in the usergroup database, connected to the port

Tab. 36: New user

Validity / Device Class	MACH 3000
Zusätzliche OPC Attribute:	
– IP-Address	IP-Address of device
– Connected-MAC-Address	MAC-Adresse of the unknown user

Tab. 36: New user

Validity / Device Class	MACH 3000
OPC Eventtype	Simple
OPC Category Identifier	PortSecurity
OPC Source Path	Device.Management.UserGroups.PortSecurity
OPC Severity	800
OPC Message Text	informing about the permission mode for this port
Zusätzliche OPC Attribute:	
– IP-Address	IP-Address of device
– Permission-Mode	Sicherheitseinstellung des Ports 1 = user 2 = group 3 = known 4 = world 5 = uplink
– Allowed-MAC-Address	At lever "user": The MAC-address allowed for this port
– Connected-MAC-Address	Actual MAC-Address at the port

Tab. 37: User group security

Validity / Device Class	MACH 3000
OPC Eventtype	Simple
OPC Category Identifier	PortSecConfigError
OPC Source Path	Device.Management.UserGroups.PortSecConfigError
OPC Severity	800
OPC Message Text	informing about an error in the usergroup configuration
Zusätzliche OPC Attribute:	
– IP-Address	IP-Address of device
– Connected-MAC-Address	The MAC-Address that is configured badly

Tab. 38: Faulty user group configuration

Validity / Device Class	All SNMP-compatible network components
OPC Event Type	Simple
OPC Category ID	AuthenticationFailure
OPC Source Path	Device.Security.Authentication-Failure
OPC Severity	800
OPC Message	Information on authentication failure during acces via SNMP
Additional OPC Attributes:	
– IP Address	IP address of the device
– Request IP Address	IP address of the requesting device
– Request Community	Community of the request

Tab. 39: Authentication failure during SNMP access

Validity / Device Class	RS2, MACH 3000
OPC Event Type	Simple
OPC Category ID	TelnetLogin
OPC Source Path	Device.Security.Telnet-Login
OPC Severity	200 (successful), 800 (failed)
OPC Message	Information on attempted login via Telnet
Additional OPC Attributes:	
– IP Address	IP address of the device
– Accessor IP Address	IP address logged in from
– Login Password	Login password (is ***** if successfully logged in)

Tab. 40: Login via Telnet

Validity / Device Class	MACH 3000
OPC Event Type	Simple
OPC Category ID	Temperature
OPC Source Path	Device.Chassis.Temperature
OPC Severity	800 (if temperature is outside limits), 600 (otherwise)
OPC Message	Information on device temperature exceeding limits
Additional OPC Attributes:	
– IP Address	IP address of the device
– Temperature	Current temperature
– Temperature upper limit	Upper temperature limit
– Temperature lower limit	Lower temperature limit

Tab. 41: Temperature outside defined limits

Validity / Device Class	RS2, Mach 3000
OPC Event Type	Simple
OPC Category ID	PowerSupply
OPC Source Path	Device.Chassis.Powersupply
OPC Severity	Depending on status: 200 (not installed), 400 (unknown), 600 (ok), 1000 (failed)
OPC Message	Information on device power supply status
Additional OPC Attributes:	
– IP Address	IP address of the device
– Power supply state	1 = ok 2 = failed 3 = not installed 4 = unknown

Tab. 42: Power supply failure

Validity / Device Class	MACH 3000
OPC Event Type	Simple
OPC Category ID	Fan
OPC Source Path	Device.Chassis.Fan
OPC Severity	Depending on status: 600 (ok), 1000 (failed)
OPC Message	Information on device fan status
Additional OPC Attributes:	
– IP Address	IP address of the device
– Fan State	1 = ok 2 = failed

Tab. 43: Fan failure

Validity / Device Class	RS2
OPC Event Type	Simple
OPC Category ID	SimpleSnmpTrap
OPC Source Path	Device.Chassis.Signalling-Relay
OPC Severity	1000
OPC Message	Information on activation of signal relay
Additional OPC Attributes:	
– IP Address	IP address of the device

Tab. 44: Signal relay activated

Validity / Device Class	MACH 3000
OPC Event Type	Simple
OPC Category ID	GroupMapChange
OPC Source Path	Device.Chassis.Groupmap-Change
OPC Severity	200
OPC Message	Information on group map change (basic boards added/removed). The new group map is coded as text consisting of "0" and "1". The text order from left to right corresponds to that from top to bottom in the Mach 3000.
Additional OPC Attributes:	
– IP Address	IP address of the device
– Groupmap	New group map as text consisting of "0" and "1"

Tab. 45: Group map changed

Validity / Device Class	MICE
OPC Eventtype	Simple
OPC Category Identifier	GroupModuleMapChange
OPC Source Path	Device.Chassis.GroupModulemap-Change
OPC Severity	200
OPC Message	Text informing that the equipment changed (modules added / removed). The new modulemap is encoded as text with "0" or "1".
Zusätzliche OPC Attribute:	
– IP-Address	IP-Address of device
– GroupModulemap	New modulemap encoded as text of "0" and "1"

Tab. 46: Group module map changed

Validity / Device Class	All SNMP-compatible network components
OPC Event Type	Simple
OPC Category ID	Link
OPC Source Path	Device.Port.Link-Down
OPC Severity	800
OPC Message	Information on link status at a port
Additional OPC Attributes:	
– IP Address	IP address of the device
– IF-Index	IF index of the port

Tab. 47: Link down at a port

Validity / Device Class	All SNMP-compatible network components
OPC Event Type	Simple
OPC Category ID	Link
OPC Source Path	Device.Port.Link-Up
OPC Severity	200
OPC Message	Information on link status at a port
Additional OPC Attributes:	
– IP Address	IP address of the device
– IF-Index	IF index of the port

Tab. 48: Link up at a port

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Readers Comments

What do you think of this manual? It is our intention that our manuals describe affected products completely and also provide important information so that the product can be used without problem. Your comments and ideas help us to raise the quality and level of information in this documentation.

Your **opinion** of this manual:

	very good	good	satisfactory	fair	poor
Exact description	O	O	O	O	O
Readability	O	O	O	O	O
Easy to understand	O	O	O	O	O
Examples	O	O	O	O	O
Structure	O	O	O	O	O
Completeness	O	O	O	O	O
Graphics	O	O	O	O	O
Drawings	O	O	O	O	O
Tables	O	O	O	O	O

Did you find any **errors** in this manual?
If so, which ones and where?

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Ideas and suggestions for improvements and additions:

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   You can order a license key with a 6 week limit so that you can evaluate this software at no extra cost. Mark the field **temporary**, **cost-free** with a cross on the form on the next page.

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